

NBER WORKING PAPER SERIES

ON THE ETHNIC ORIGINS OF AFRICAN DEVELOPMENT CHIEFS AND PRE-COLONIAL
POLITICAL CENTRALIZATION

Stelios Michalopoulos
Elias Papaioannou

Working Paper 20513
<http://www.nber.org/papers/w20513>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2014

We would like to thank the Editor and two anonymous referees for their insightful comments. Stelios Michalopoulos has no relevant financial interests or funding for this project. Elias Papaioannou also has no relevant financial interests or funding for this project. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2014 by Stelios Michalopoulos and Elias Papaioannou. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

On the Ethnic Origins of African Development Chiefs and Pre-colonial Political Centralization
Stelios Michalopoulos and Elias Papaioannou
NBER Working Paper No. 20513
September 2014
JEL No. O10,O40,O43,Z1,Z13

ABSTRACT

We report on recent findings of a fruitful research agenda that explores the importance of ethnic-specific traits in shaping African development. First, using recent surveys from Sub-Saharan African countries, we document that individuals identify with their ethnic group as often as with the nation pointing to the salience of ethnicity. Second, we focus on the various historical and contemporary functions of tribal leaders (chiefs) and illustrate their influence on various aspects of the economy and the polity. Third, we elaborate on a prominent dimension of ethnicity, that of the degree of complexity of pre-colonial political organization. Building on insights from the African historiography, we review recent works showing a strong association between pre-colonial centralization and contemporary comparative development both across and within countries. We also document that the strong link between pre-colonial political centralization and regional development -as captured by satellite images of light density at night- is particularly strong in areas outside the vicinity of the capitals, where due to population mixing and the salience of national institutions ethnic traits play a lesser role. Overall, our evidence is supportive to theories and narratives on the presence of a "dual" economic and institutional environment in Africa.

Stelios Michalopoulos
Brown University
Department of Economics
64 Waterman Street
Providence, RI 02912
and NBER
smichalo@brown.edu

Elias Papaioannou
London Business School
Regent's Park
Sussex Place
London NW1 4SA
United Kingdom
and NBER
papaioannou.elias@gmail.com

1 Introduction

Over the past years while researching the political origins of contemporary African development, we were struck by an apparent disconnect between the focus of works in the economics literature and the narrative permeating the African historiography.

On the one hand, most studies in economics study the role of country-wide features, such as the national legal framework and property rights institutions, the degree of political freedom and democracy, foreign aid, and ethnic fractionalization. In the same vein, during Africa's post-independence era, the international community designed and implemented policies and interventions at the country level. For example, the disbursement of foreign aid to various regimes has been conditional on reducing graft and boosting bureaucratic efficiency. Similarly, the UN Millennium Development Goals set national-level targets regarding poverty, education and health whereas international media focus on the role of national leaders and the adequacy or deficiencies of national policies in shaping African development.

On the other hand, the African historiography downplays the role both of the colonial state and the post-independence governments in shaping comparative economic and political development. In many parts of the continent the central state is weak and incapable of providing basic functions, such as policing and taxing, while in several countries the national government exerts limited influence outside the capital. Moreover, even in countries where national structures are relatively strong, local tribal leaders (chiefs) often act as the intermediaries between the central administration and the local economy. This strand of literature, hence, stresses the predominant role of the ethnicity, de-emphasizing nationwide features.

In his synthesis of works on the political economy of African development, Herbst (2000) notes that quite often Western policy makers and academics alike when discussing African countries project their notion of nation-states that is based on strong governments, pervasive national identification, and well-defined political boundaries. Yet, most African states defy the Weberian notion of an entity that enjoys a legitimate monopoly of violence providing order, security, and protection of private contracts. Throughout most of its post-independence history, most African states have not been able to monopolize violence and uniformly enforce the law. Moreover, national identity has only recently started to emerge, as most African states are colonial makings without strong historical antecedents (notable exceptions include Ethiopia and to a certain extent Botswana).

Structure - Results Preview This paper presents evidence and reviews studies on the "dual", national and ethnic, institutional structure of many African states: National institutions, policies, and bureaucrats on the one hand; and ethnic norms, institutions, and traditional leaders

(chiefs) on the other.¹

We start our analysis (in Section 2) adding empirical content and weaving together two seemingly unrelated characteristics of the African landscape: the salience of ethnic identity and the limited state capacity of African governments. In particular, using survey data from 18 – 20 Sub-Saharan African countries on ethnic identification and cross-country proxies of state capacity, such as legal-court quality and tax capacity, we show that these two features are closely linked. Motivated by this observation we lay out a framework where ethnic-specific norms, institutions, and practices, interact with country-wide structures and state capacity in general.

Specifically, in Section 3 we examine some salient features of ethnic structures, discussing works in political science, anthropology, and economics on the functions of tribal leaders (chiefs) and the importance of ethnic norms in contemporary Sub-Saharan Africa. We supplement our discussion with evidence on the contemporary role of chiefs using data from the Afrobarometer Surveys (2005, 2008). The analysis reveals that tribal leaders play a crucial role in the allocation of land rights and dispute resolution within communities.

In Section 4 we turn our attention to a key ethnic trait that has been linked to African development, the pre-colonial complexity (centralization) of political (and social) organization. We start our analysis presenting anthropological maps illustrating the variability of political structures in pre-colonial Africa, ranging from large centralized states, such as the Zulu empire, to acephalous societies organized at the village level, such as the Nuer. We then discuss the likely channels linking pre-colonial ethnic political centralization to contemporary development through case studies.

In Section 5 we discuss our recent research (Michalopoulos and Papaioannou (2013b)) and other related works showing with formal econometric techniques and novel georeferenced data (satellite images of light density at night) the strong association between ethnic-specific pre-colonial political centralization and contemporary regional development both across and within countries. In line with narratives on the presence of a "dual" institutional-economic environment, we show that ethnic institutions are particularly relevant in (mostly rural) areas further from the capitals. In the latter it is the national institutional structures that influence economic performance (Michalopoulos and Papaioannou (2014)).

In the last section we summarize the key lessons and discuss avenues of future research in management science.

¹In this regard our study contributes to recent works in management/marketing/strategy emphasizing the institutional challenges that firms face in their attempt to function in areas exhibiting different and coexisting institutional frameworks, both in Africa and elsewhere (e.g., Kistruck, Sutter, Robert B. Lount, and Smith (2013), Mair, Marti, and Ventresca (2012), Webb, Kistruck, Ireland, and David J. Ketchen (2010); Rivera-Santos, Ruffín, and Kolk (2012), Viswanathan, Rosa, and Ruth (2010), Sridharan and Viswanathan (2008)).

2 Ethnic Identification and State Capacity

In this Section we first present evidence on the salience of ethnic identity across 18 – 20 Sub-Saharan African countries and the limited state capacity of the African states. We then show that these two features are inter-linked, suggesting that if one is to explain the weak state capacity of African states it is crucial taking into account ethnic-specific norms.

2.1 Ethnic Identification

Data For our analysis we exploit data from the *3rd* and *4th* rounds of the Afrobarometer Surveys (2005, 2008) that cover 18 and 20 Sub-Saharan economies, respectively.² Both rounds were conducted in Benin, Botswana, Cape Verde, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. The *4th* round also covers Burkina Faso and Liberia.³ The Afrobarometer team in each country implements nationally-representative interviews in a random sample of 1,200 or 2,400 individuals of voting age. The surveys record information on respondents' education, living conditions, access to public goods like a sewage system and electrification, beliefs (e.g., on the merits of democracy, corruption perceptions), civic engagement, trust, and ethnic identification.

Patterns In Figures 1*a* – 1*b* we tabulate people's responses on whether they identify more with their ethnicity or with their nation; the pie charts present the corresponding percentages. The question reads: "*Let us suppose that you had to choose between being a [Ghanian/Kenyan/etc.] and being a [respondent's identity group]. Which of these two groups do you feel most strongly attached to?*" The structure of the question is particularly useful as it directly compares national to ethnic identity. Figures 1*a* – 1*b* illustrate the importance of ethnic identity. Across a sample of approximately 25,000 individuals in each round, only a third identify solely with the nation, whereas a large fraction of the population (around 40% in the full sample) identifies both with their country and their ethnicity. Roughly 15% of the respondents identify either exclusively or overwhelmingly with their ethnicity.

Figure 2*a* reveals that there is considerable variation across countries on ethnic identification (for brevity we report statistics only from the *4th* round of the Afrobarometer Surveys). Ethnic identification is the lowest in Tanzania, where chiefship was formally abolished in the 1960s and where nation-building policies were implemented in the 1970s and the 1980s. Ethnic identification is the highest (and national identification the lowest) in Mali, Burkina Faso, Benin,

²Logan (2011) also explores the role of ethnic norms and the influence of ethnic leaders in Africa using data from the Afrobarometer Surveys.

³In most graphs/figures we exclude Cape Verde since there are no traditional authorities and there were no questions on the role of ethnicity.

Uganda, and Nigeria, countries marked by ethnic conflict and ethnic-based authoritarian regimes in the 1970s and 1980s.

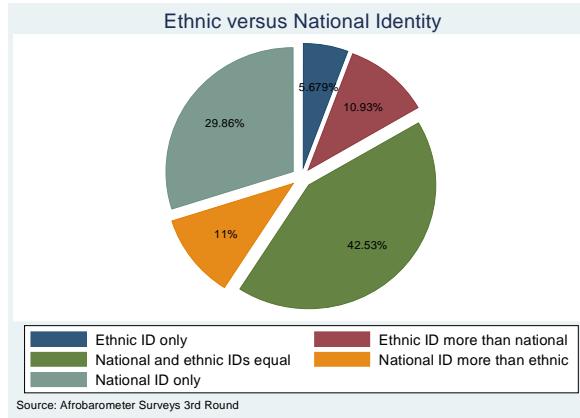


Figure 1a: Afrobarometer Surveys 2005
Ethnic versus National Identity

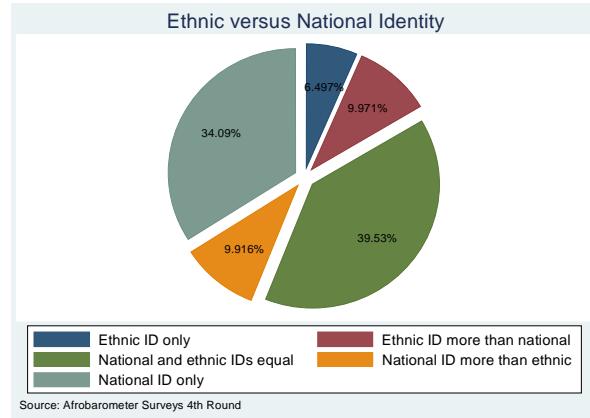


Figure 1b: Afrobarometer Surveys 2008
Ethnic versus National Identity

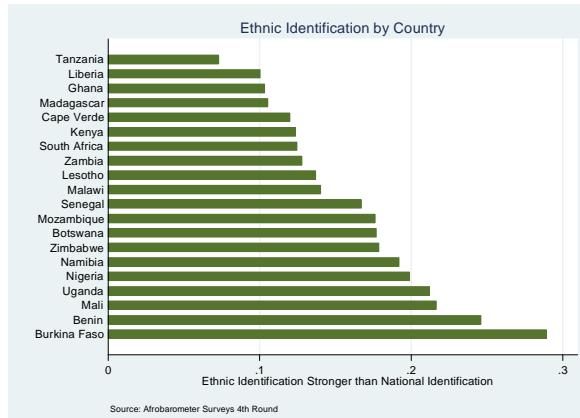


Figure 2a: Afrobarometer Surveys 2008
% of Respondents with Ethnic Identity
Stronger than National Identity

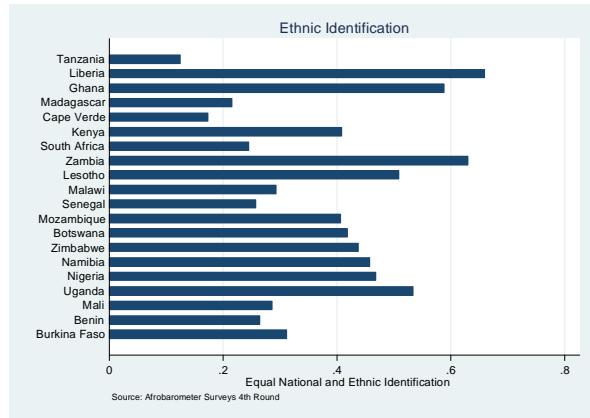


Figure 2b: Afrobarometer Surveys 2008
% of Respondents with Ethnic Identity
Equal to National Identity

Figure 2b shows that national and ethnic identification coexist across most (though not all) countries. This dual-identification appears in line with the dual authority and mixed governance view of African states, where national and ethnic institutions and policies coexist, sometimes in harmony and other times in conflict (Herbst (2000), Sklar (1993)). This pattern is also in accord with Mahmood Mamdani's (1966) observation that since decolonization, Africans have been subject to both a modern legal system originating in the colonial state and a customary one, rooted at the ethnic level and enforced by powerful chiefs. The dual identification of African citizens may also be related to the "dual" economy paradigm of Arthur W. Lewis (1954), who argued that underdeveloped countries are characterized by an "advanced" sector -usually associated with manufacturing and urbanization- and a "backward" sector -typically associated with

communal property rights in agriculture (see also Migdal (1988)).

As it will become apparent from our discussion and the evidence below, the salience of ethnic identity reflects the far-reaching role of ethnic structures in shaping the social, economic and political milieu of African citizens. For example, in several countries customary, rather than national, law governs land rights with tribal leaders and local chiefs settling disputes and acting as formal or ad-hoc arbitrators and judges. Moreover, ethnic leaders enjoy significant popular support, are perceived as being less corrupt than government officials, and are more trusted than members of the parliament, national courts, and police officers.

Explanations Ethnic identification in Africa is driven by a variety of factors. First, Sub-Saharan Africa is by far the most ethnically and linguistically diverse region of the world with African ethnicities characterized by distinct cultural norms and economic traits (Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003)).⁴ According to the Alesina *et al.* (2003) index, average (median) ethnic fragmentation in Africa is 0.63 (0.72), while the average (median) in Asia is 0.42 (0.43), in Europe 0.27 (0.22), in South America 0.49 (0.57), and in North America 0.39 (0.42). Moreover, in Africa an ethnic group is often also a linguistic group, which fosters interaction within group members and limits communication between groups. Additionally, due to the low levels of financial development, risk sharing is facilitated within extended families, clans, and tribal groups.

Second, ethnic identity is magnified by income differences between ethnic groups. Robinson (2001) stresses the key role of ethnic inequality in creating conflict and spurring ethnic identification across Africa, while Alesina, Michalopoulos, and Papaioannou (2012) show that economic differences across ethnic lines are the highest in Africa compared to Europe, Asia, and the Americas.⁵

Third, national politics have a strong ethnic component, as parties are formed in many countries across ethnic cleavages (e.g., Franck and Rainer (2012), Eifert, Miguel, and Posner (2010)). Alesina, Michalopoulos, and Papaioannou (2014) further show that ethnic inequality goes in tandem with political inequality, while Michalopoulos and Papaioannou (2013a) show that ethnic-based discrimination and exclusion from power is also linked to a key historical ethnic trait, ethnic partitioning.

⁴ A region's ecology and its state history have been proposed as drivers of ethnic diversity. For example, Michalopoulos (2012) shows how geographic diversity and proximity to the equator increase ethnic diversity via the formation of location-specific human capital along heterogeneous land endowments, whereas Ahlerup and Olsson (2012) show that ethnic diversity is lower in countries with a long history of statehood. Thus, the ecologically diverse endowments across Africa coupled with its overall limited history of state formation may explain its current high levels of ethnic diversity.

⁵ Alesina, Michalopoulos, and Papaioannou (2012) estimate that the average (median) ethnic Gini index for African countries in 2009 is 0.54 (0.61), while in Asia the mean (median) is 0.45 (0.49), in Europe the mean (median) is 0.27 (0.21), and in America the mean (median) is 0.37 (0.40).

Fourth, in some instances colonization reinforced or even created -rather than attenuated- ethnic identity, because Europeans collaborated with specific ethnic groups in their indirect rule policy (Mamdani (1996); see Blouin (2013) for a nice case-study application of the role of Belgian policies towards the Hutu and the Tutsi in Rwanda and Burundi). Fifth, Nunn (2008) shows that the slave trades -that preceded colonization- had significant long-run negative consequences on development, mostly by creating animosity among ethnicities and leading to inter-ethnic conflict. In line with this idea, Nunn and Wantchekon (2011) document a strong negative within-country association between historical enslavement and proxies of social-civic capital.

Finally, there are significant differences in pre-colonial institutional legacies across African groups which translate into contemporary differences in regional economic performance both across and within countries (Gennaioli and Rainer (2007), Michalopoulos and Papaioannou (2013b)) whereas Michalopoulos, Putterman, and Weil (2014) show that individuals tracing ancestry to ethnicities that derived a larger share of subsistence from agriculture in the pre-colonial times are more educated and prosperous today.

A Caveat - Group Identity Outside Africa Anecdotal evidence suggests that ethnic identification is not a feature unique to Africa, with populations in the Caucasus region, even within some European countries (e.g., Basque country, Scotland, Flanders) harboring strong local identities. In an attempt to shed some light on whether ethnic (as compared to national) identification is higher across African countries, as compared to other parts of the world, we pored through data from the Latinobarometer Surveys, which cover around 20 countries in Latin America, the Life in Transition Surveys (LiTS) which cover around 35 countries in Eastern Europe and Central Asia, and the Asian Barometer Surveys that cover 11 Asian countries. Unfortunately, it is only in the context of Africa that respondents are asked to rank their ethnic identity vis-à-vis their national one. In the other surveys questions on identity are asked *separately* for the nation and the group that usually regards religious (rather than ethnic) affiliation. For example, in the Asian Barometer Surveys of 2004 and 2005 there are questions on the salience of national identity vis-à-vis *religious* identity. The responses show that for all countries in South East Asia, national identification is quite strong, with roughly 15% of the respondents ranking their religious identity as more important than their national one. In Central Asia national identification is relatively low and religious identity is important for a significant part of the population.⁶ Due

⁶ Here we report the percentage of respondents in each country that "think themselves as being part of their country's people" and the percentage (in parenthesis) of people answering that "religion is more important than nationality". South Korea: 95.94% (2.81%), Japan 93.15% (2.67%), Myanmar 99.13% (41.25%), Philippines 99.5% (13.5%), Thailand 99.5% (9.63%), Indonesia: 93.36% (28.85%), Vietnam 96.25% (not asked), Malaysia 93.34% (14%), Singapore 80.40% (11.38%), Laos 97.63% (not asked), Brunei 92.57% (17.91%), Afghanistan: 98.38% (58.35%), Bangladesh: not asked (33.13%), Bhutan: 97.75% (13.36%), India: 99.92 % (9.29%), Kazakhstan 46.99% (6.75%), Kyrgyzstan 66.88% (20.50%), Maldives 100% (16.20%), Mongolia 94.99% (2.50%), Nepal: 99.13% (20.50%), Pak-

to the non-comparable nature of the datasets between continents we cannot provide meaningful counterfactuals. Nevertheless, this pattern suggests that in countries in Asia religious identity may be the relevant cleavage for understanding group identity.

2.2 State Capacity

In recent years works on political economy and comparative development have focused on the role of state capacity. Building on insights from Tilly (1985) and Migdal (1988), among others (see Hintze (1970) for an early contribution), Acemoglu (2005) and Besley and Persson (2011) study the origins and implications of the inability of many governments to enforce contracts, safeguard private property, and collect taxes.⁷ Legal and fiscal capacity as well as state fragility are linked to historical factors related to civil and international conflict. African national governments have been weakened considerably by long-lasting civil wars and ethnic violence that tend to be driven by the legacy of Africa's slave trades and the artificial drawing of national borders during the "Scramble for Africa" in the late 19th century. The latter led to the partitioning of several groups into different countries and forced heterogeneous populations to share state resources. The arbitrariness of modern-day African borders has crucially contributed to the weakness of national governments, fomenting civil conflict, ethnic hatred, and violence (see Asiwaju (1985), Alesina, Easterly, and Matuszeski (2011), Englebert, Tarango, and Carter (2002), and Michalopoulos and Papaioannou (2013a)).

Herbst (2000) argues that due to the challenging geography (deserts and rainforests) and the limited colonial investments, national governments in Africa find it extremely difficult to broadcast power beyond the capitals in peripheral regions. According to Mamdani (1996) the limited penetration of the nation-state is also related to the legacy of Europe's indirect rule during the colonial times, under which the colonial power was exerted inland via local chiefs and a very small number of European administrators (see Acemoglu, Reed, and Robinson (2014) for a nice case study of Sierra Leone). In line with this conjecture, Michalopoulos and Papaioannou (2014) show that differences in the quality of national institutions across split-by-the-border ethnic homelands do not map on average into differences in economic performance (captured by images of satellite light density). Nevertheless, focusing on ethnic homelands close to the capital cities the association between national institutions and development becomes positive and significant. Moreover, Michalopoulos and Papaioannou (2014) show that law enforcement (for crimes and tax evasion) and national (as opposed to ethnic) identification decays in areas far from the capital,

istan 96.34% (76.80%), Sri Lanka 95.19% (16.24%), Tajikistan 82.38% (23.50%), Turkmenistan 93.13% (7.38%), Uzbekistan 59.75% (23.88%).

⁷See also Aghion, Persson, and Rouzet (2012), and Gennaioli and Voth (2011), among others. In an early contribution, Johnson, Kaufmann, and Shleifer (1997) stressed the importance of state capacity for the development path of transition countries in Eastern Europe and Central Asia in the 1990s.

further illustrating the limited penetration of the state outside the capital centers.

Figure 3a plots the cross-country average of two (related) measures capturing state fragility in 2011 across continents, using data from the *Center for Systemic Peace* (Marshall and Cole (2011)). The blue bars plot the average of a 0 – 25 composite index (*state fragility index*) that captures the effectiveness and legitimacy of the government to provide security and protect its citizens from internal conflict, the openness and inclusiveness of political institutions, and the government’s ability in tackling poverty and infant mortality and promoting development (higher scores indicate more fragile countries). In grey bars we exclude the economic sub-index (*alternative state fragility index*), so as to concentrate on the security and the legitimacy of the national government. In spite of the recent democratization wave and the decline of conflict, Africa is still the continent with the highest state fragility. A similar picture emerges when we look at other proxies of state weakness, such as civil wars, violence against the civilian population, secessions, etc. (results not shown).

Figure 3b shows our tabulation of the continental averages of two widely-used proxies of state-level fiscal capacity. Following the burgeoning literature on state capacity (see Besley and Persson (2011)), we proxy fiscal capacity using the share of income taxes as a fraction of GDP (in the 1990s) and the share of total taxes as a fraction of GDP (in the 1990s); the underlying idea is that strong states are capable of taxing wealth (mostly via direct taxation) so as to provide basic public goods, such as security, policing, etc. In contrast, weak states are incapable of collecting taxes relying heavily on tariffs and import duties (as compared to personal income taxation). Fiscal capacity is considerably lower in Africa (and Asia) as compared to the Europe and Oceania.⁸

Figure 3c illustrates one of the key insights of the recent literature on state capacity; the complementarity between fiscal capacity (as reflected on the share of income taxes to GDP) and legal capacity, as reflected in a composite index of government anti-diversion policies that measures law and order, bureaucratic quality, corruption, risk of expropriation and risk of government repudiation of contracts.⁹ [African states are abbreviated with large, bold fonts.] With the exception of Botswana, South Africa, and to a lesser extent Namibia, all African countries score very low on both fiscal and legal capacity. In absence of an efficient tax collection administration, African states depend mainly on tariff revenues and royalties from oil, diamond and gold mines, and other natural resources (this is also a more general pattern that applies to non-African countries rich in natural resources). Property rights and legal institutions are similarly weak, as

⁸The low percentages in the Americas are mostly driven by the Central and Latin American countries.

⁹The results are similar if we use alternative proxy measures of fiscal capacity (such as total taxes as a share of GDP) or legal capacity (reflecting, for example, court efficiency or the formalism of the legal system). Acemoglu *et al.* (2001, 2002) use the ICRG government anti-diversion index to measure the quality of national property rights institutions.

in many cases the government cannot enforce national legislation, while in other instances the government itself has expropriated land and confiscated private property.

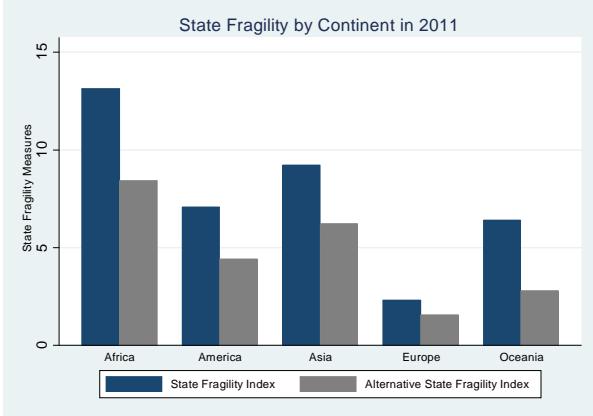


Figure 3a:
State Fragility by Continent, 2011

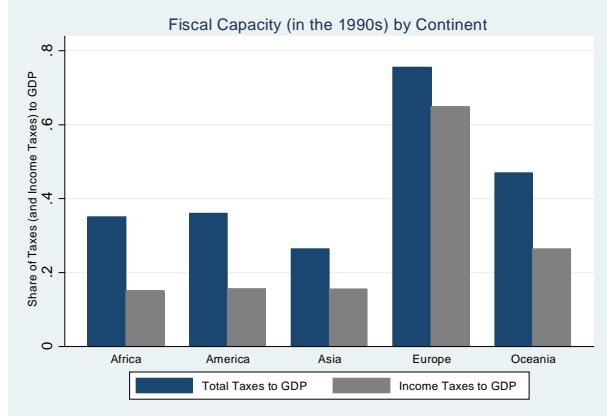


Figure 3b:
State Capacity by Continent, 1990

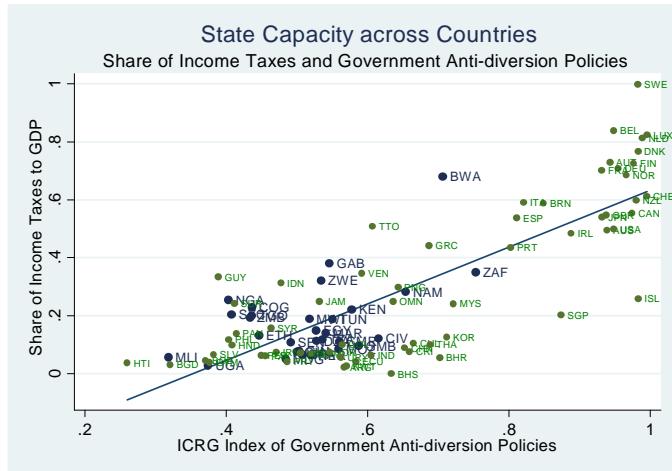


Figure 3c: Fiscal and Legal State Capacity

2.3 The Salience of Ethnic Identity in Weak States

Figures 4a – b show how legal capacity and the salience of ethnicity are related. The figures plot an institutional capacity index that reflects government’s anti-diversion policies (in the vertical axis) against the average value of a self-identification index that ranges from 1 to 5 with lower values indicating stronger ethnic (as opposed to national) identification and higher values marking stronger national (as opposed to ethnic) identification, using data from the 3th and the 4th round of the Afrobarometer Surveys, respectively. There is a positive association between the individuals’ self-identification with the nation and state capacity in safeguarding property rights.

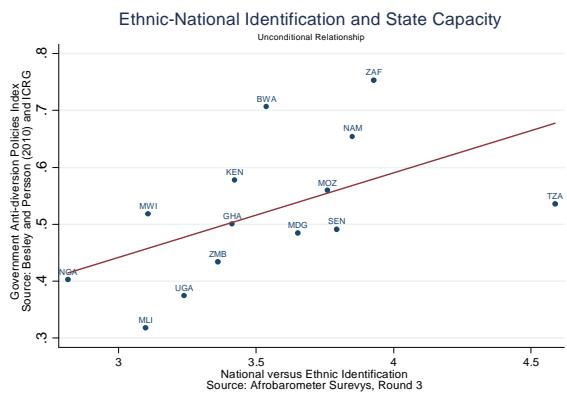


Figure 4a: State Capacity in 2000 and Ethnic Identification in 2005

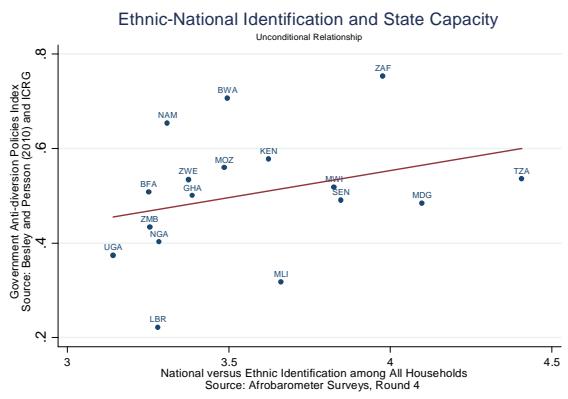


Figure 4b: State Capacity in 2000 and Ethnic Identification in 2008

In Figures 5a – b we examine the association between the percentage of individuals in each country that identify either solely or mostly with their ethnic group and an index measuring the formalism and inefficiencies of that country’s legal system; the legal formalism index comes from the World Bank’s Doing Business project. It measures the log number of business days it takes to collect an unpaid debt contract that equals 200% of per capita GDP via courts (see Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003)). There is a significant positive association between identifying with ethnicity and this proxy of legal capacity.¹⁰ While it is hard to pin down the direction of causality, the pattern suggests that ethnic identification (and reliance on ethnic - rather than national- characteristics) acts as a substitute for a weakly-institutionalized state.

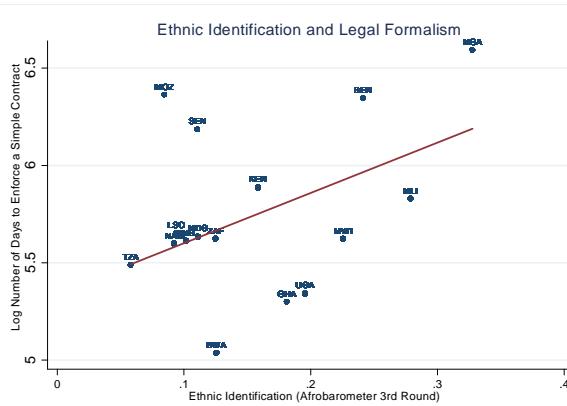


Figure 5a: State Legal Efficiency in 2000 and Ethnic Identification in 2005

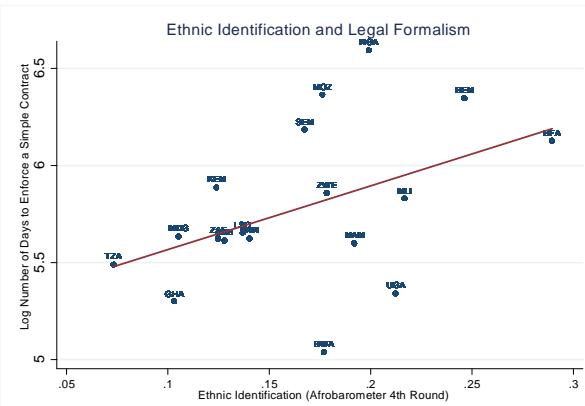


Figure 5b: State Legal Efficiency in 2000 and Ethnic Identification in 2008

¹⁰The results are similar if we use alternative proxy measures of legal formalism that are based on the speed and procedures required to process standard legal cases (such as evict a tenant for non-payment or collect a bounced check) in national courts (see Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) and Djankov, Mc Liess, and Shleifer (2007)).

3 Chiefs

Given the salience of ethnicity and the weak capabilities of many African states shown above, it is tempting to investigate the common factors that give rise to these phenomena. In this section we discuss a somewhat neglected aspect of African politics that is related both to the dominant role of the ethnicity and the limited state capacity, namely the role of traditional leaders (chiefs). First, using case studies we discuss the key responsibilities that ethnic leaders have in various parts of Africa. Second, we present evidence from the Afrobarometer Surveys illustrating the importance of traditional leaders in regulating various aspects of the economy and the polity.

3.1 Case-Study Evidence

The role and functions of traditional leaders are multi-dimensional and quite heterogeneous across the continent.

Customary Law and Property Rights First, a plethora of evidence points to the importance of local ethnic authorities in allocating land rights, mostly in rural communities that are quite often subject to customary law. This is not surprising since at independence many countries maintained a "dual" legal system. Under this system, first established by the colonizers, customary law applied to African affairs and European law applied to the transactions of the settlers, mostly in the capitals and the main ports (Mamdani (1996)).

While upon decolonization some countries attempted to integrate the legal systems of the urban hubs and the countryside, the legal order in many countries explicitly recognized customary rules. For example, Mamdani (1996) observes that at independence in Senegal "*78 officially recognized customs, chosen from 33 different ethnic groups, were applicable in courts.*" In Ghana, the 1979 Constitution gave traditional leaders explicit power over land in the north of the country. Similarly, in South Africa the 1994 Ingonyama Trust Act put one-third of the land in the province of KwaZulu-Natal under the trusteeship of the Zulu king and subsequently the 1996 Constitution formally recognized chiefs' role in settling land disputes. Likewise, in Zambia the 1995 Land Act recognized chiefs' roles in land administration. Herbst (2000) documents that 14 out of 39 Sub-Saharan countries have passed legislation or constitutional amendments (in the case of Uganda and Ghana) formally recognizing the role of ethnic institutional structures in settling property rights disputes and enforcing customary law.¹¹ Baldwin (2014) discusses the case of Mozambique, where the role of local chiefs (*régulos*) was officially recognized in 1994. Even in countries where the Constitution or national legislation do not officially accept customary law,

¹¹These countries are: Botswana, Ghana, Gambia, Guinea-Bissau, Liberia, Malawi, Niger, Rwanda, Sierra Leone, Swaziland, Togo, Uganda, Zambia, and Zimbabwe.

ethnic leaders have considerable de facto power in allocating land. For example, Herbst (2000) writes that in "*the Democratic Republic of Congo 97% of all land is governed by community tenure (and) reforms aimed at over-turning local practices have been defeated*". Similarly for Gabon, Herbst (2000) notes that "*traditional practices still govern the majority of land.*"

In his systematic exploration of property rights institutions and development across the Ivory Coast-Ghana border, Bubb (2013) documents that while the two countries have quite distinct formal (*de jure*) institutions governing land rights (with Ghana, unlike Ivory Coast, explicitly recognizing customary law), there are no differences in the actual enforcement of property rights. Using a regression discontinuity approach that identifies the effect of national institutions at the border Bubb (2013) shows that households on either side of the border enjoy similar land rights. These are subject to local customary law (dating to the pre-colonial states of the Ashanti and the Akan) and the power of local chiefs on either side of the border. According to Ashanti customary law, for example, land rights are not individualistic but are vested in the community with local chiefs acting as the arbitrators and the custodians. (Bubb (2013) reproduces an Ashanti adage saying that "*the farm is my property, the land is the chief's.*") This result is in line with the evidence of Goldstein and Udry (2008) who show that local chiefs and clans exert significant de facto power in assigning land in rural Ghana (see also Besley (1995) and Kutsoati and Morck (2012)).

Political Power and Ethnic Voting Second, in many countries tribal leaders have considerable political influence on local and national politics (see Posner (2005) for an overview).¹² Focusing on Sierra Leone, Acemoglu, Reed, and Robinson (2014) and Acemoglu, Chaves, Osafo-Kwaako, and Robinson (2014) describe how local chiefs cooperated with the British and subsequently with the national government in a "quid pro quo" regime where traditional leaders provided votes and support for national policies in exchange for legitimacy, strengthening their role, and other perks. Casey (2012) documents the strong correlation between ethnic origin and voting in Sierra Leone. She notes that the Temne-based *All Peoples' Congress* party won 36 of the 39 seats in the Temne dominated Northern provinces, while the Mende-linked parties (the Sierra Leone Peoples' Party and the Peoples' Movement for Democratic Change) won all but one seats in the Mende-dominated Southern provinces (see also Casey, Glennerster, and Miguel (2013)).

Focusing on Zambia, Posner (2005) provides evidence that ethnic identity rather than political ideology permeates national politics. Baldwin (2013) documents that in Zambia local chiefs exchange their influence on the local community with the national government during

¹²Many African national leaders, such as Nelson Mandela, Jean-Bedel Bokassa, and Julius Nyerere come from families of chiefs and old kings.

parliamentary elections in return for public goods provision. Interestingly, she shows that voters, acting in a sophisticated way, tend to follow the chiefs, when they perceive them as collaborating with politicians in getting public funds channelled to their district.

Turning to Eastern Africa, Long (2012) demonstrates the strong ethnic roots of voting in Kenya. Conducting a nation-wide household survey close to the 2007 presidential elections Long finds that Mwai Kibaki, a Kikuyu, received close to 95% percent of the votes of his fellow Kikuyus, while Raila Odinga, Luo, got almost all (99%) of Luo votes, and Kalonzo Musyoka was voted by 80% of his fellow Kambas.¹³

Using data from 18 countries and employing within-country over time variation Franck and Rainer (2012) show that national leaders have significantly increased primary school attendance and reduced infant mortality within their ethnic group. Similarly, using sub-national data from the countries covered in the Afrobarometer Surveys, Baldwin (2014) shows that national leaders usually cede control to local chiefs from other ethnic groups in an attempt to form political coalitions.

Other (Public Goods, Taxation) Third, besides their role in allocating property rights and influencing local and national politics, ethnic leaders perform a variety of other functions, such as collecting taxes and providing local public goods. To some extent, this stems from the colonial legacy of indirect rule, under which local government official and ethnic leaders collected taxes and provided security (Mamdani (1996)). For example, in Sierra Leone local chiefs collect taxes, fees, and royalties from diamond mines (Glennerster, Miguel, and Rothenberg (2013)). Similarly, Mamdani (1996) argues that in spite of the land nationalization legislation in 1973 in the Democratic Republic of Congo, local chiefs still collect levies and usage fees from land. Moreover, Englebert (2002) shows that in contemporary Uganda, ethnic Buganda chiefs collaborate with the local government officials in various administrative duties.

3.2 Evidence from the Afrobarometer Surveys

Data from the 4*th* round of the Afrobarometer Surveys, which include an array of questions on the role of traditional leaders/authorities, provide an updated portrait of the role of ethnic leaders and local institutions across African countries.

Influence of Ethnic Leaders in Governing the Local Community Figure 6*a* reports the distribution of respondent's views on the actual influence of ethnic leaders. The question

¹³This of course is not to say that ethnicity is the only determinant of voting behavior across African countries. For example, focusing on Ghana, Long and Hoffman (forthcoming) find little evidence of ethnic-based voting, whereas Casey (2012) shows that information about a candidate's quality mitigates the role of ethnic affiliation on voting in Sierra Leone.

reads "How much influence do traditional leaders currently have in governing your local community?". Only a fifth of respondents reply that traditional leaders have absolutely no influence in local governance. More than half of respondents believe that traditional leaders exert either a great deal (28%) or a considerable deal (26%) in governing the local community, while the remaining 25% reply that ethnic leaders play only a small role. As with ethnic identification, there is variation across countries, with ethnic leaders' role being the strongest in Malawi and Zimbabwe and the weakest in Tanzania and Madagascar (Figure 6b). Another interesting feature that emerges from Figure 6b, where besides country means we also plot the standard deviations, is that there is heterogeneity even *within* countries, suggesting that ethnic-specific features may be important drivers of traditional leadership's influence.

One may wonder whether the significant influence of traditional leaders today masks their declining importance or their disapproval from the people. Figures 7a – 7b reveal that this is not the case. First, according to Figure 7a more than 40% of respondents reply that they want the influence of traditional leaders to increase *considerably*; and approximately 25% reply that they want their influence to increase *somewhat*; whereas only 10% of respondents want the role of tribal leaders to decrease. Second, even in countries where traditional leaders exert relatively small influence (as in Madagascar, Senegal, and Tanzania) the majority of individuals reply that they want their role to increase (Figure 7b). Third, an interesting case appears to be Zimbabwe where the role of tribal leaders is quite strong and at the same time people reply that they want their role to increase further. Most likely, this pattern reflects the chaotic environment (hyperinflation, conflict, crime) that followed the confiscation of white-owned farmlands in 2007 – 2009; if this is indeed the case, it suggests that when national policies fail people tend to fall back on local ethnic-specific institutional structures.



Figure 6a: Afrobarometer Surveys 2008
Actual Influence of Traditional Leaders
across All Countries



Figure 6b: Afrobarometer Surveys 2008
Actual Influence of Traditional Leaders
by Country (mean and st. dev.)

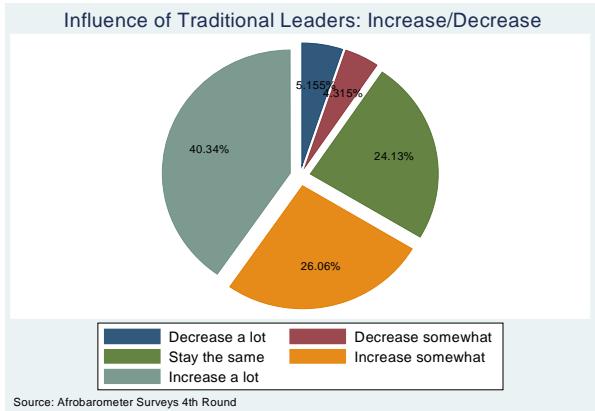


Figure 7a: Afrobarometer Surveys 2008
% of Respondents that Want the Influence
of Traditional Leaders to Increase

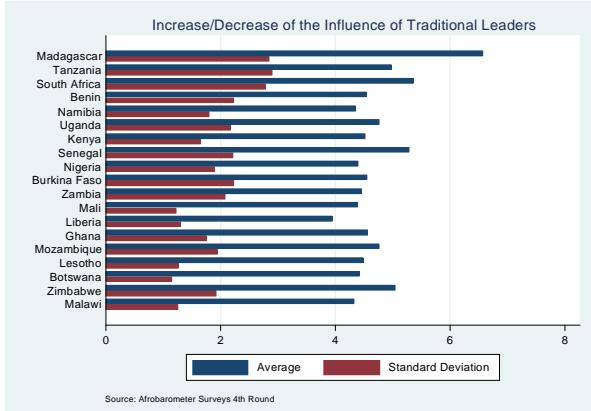


Figure 7b: Afrobarometer Surveys 2008
% of Respondents that Want the Influence of
Traditional Leaders to Increase, by Country

Figures 8a – 8c provide some insight on the underlying reasons behind the influence and popularity of traditional leaders. Figure 8a plots the average (across all respondents) of a corruption perception index that reflects individuals' beliefs on the pervasiveness of graft among various types of officials. The index ranges from zero to three with higher values indicating that the majority of members of the parliament, government officials, elected local assembly members, and traditional leaders is perceived being corrupt. People perceive traditional leaders as being significantly less corrupt than government officials and elected members of the national or the local assembly. This pattern applies to all countries except Malawi and is especially strong in Uganda, Mali, and Senegal (results not shown).

A similar picture emerges when we compare the respondents' answers to a question capturing the responsiveness to peoples' needs of government officials, members of parliament and traditional leaders. The question reads: "*How much of the time do you think the following try their best to listen to what people like you have to say?*" The index ranges again from 0 to 3 with higher values indicating a higher degree of responsiveness. Figure 8b shows that individuals reply that traditional leaders try much harder to listen to what people say compared to elected officials in the national parliament or in local assemblies. Importantly, this pattern applies to each country separately (results not shown).

In Figure 8c we examine people's trust towards tribal leaders and compare it with trust towards members of the parliament and elected local assembly councilors. The trust index ranges from 0 to 3 with higher values indicating more trust. The average value for trust towards traditional leaders is close to 2, while the mean values for the national parliament and the local assemblies is half a standard deviation lower (1.7 and 1.6). Trust towards traditional leaders is

also higher compared to trust towards the police (average of 1.56) or the courts (average 1.77).

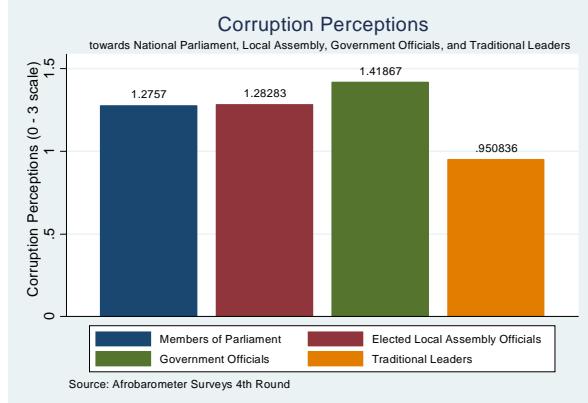


Figure 8a: Afrobarometer Surveys 2008
Corruption Perceptions (0 – 3 scale)

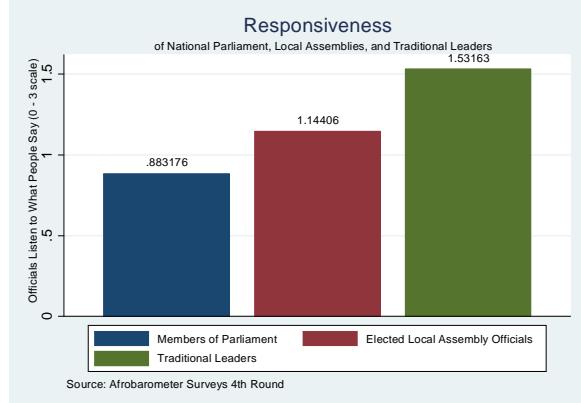


Figure 8b: Afrobarometer Surveys 2008
Responsiveness (0 – 3 scale)

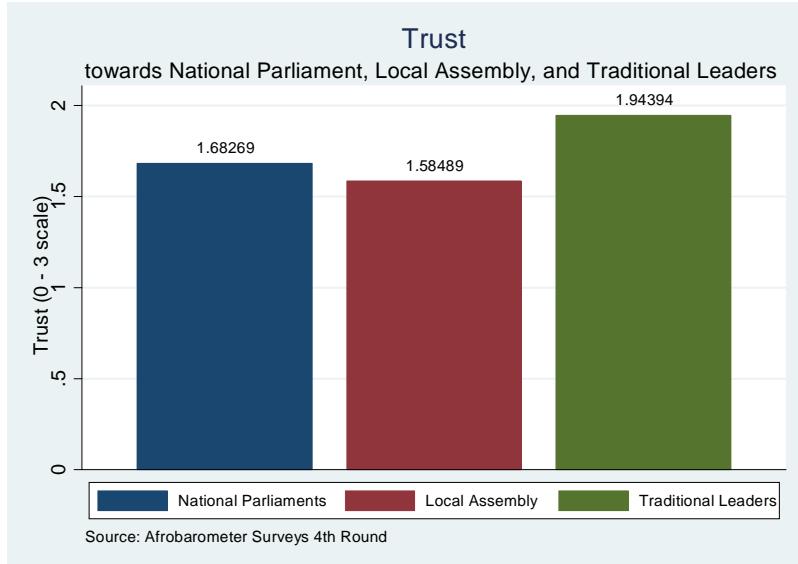


Figure 8c: Afrobarometer Surveys 2008
Trust (0 – 3 scale)

Chiefs' Responsibilities But what exactly traditional leaders do? Is their power solely derived from tradition or do they actually perform specific duties? In the case studies reviewed above we described some of the tasks that traditional authorities undertake. Here we rely on survey responses to obtain direct evidence on the type of duties performed. In particular, we examine respondents' answers on who has primary responsibility for providing basic public goods and some key government tasks, such as keeping the community clean, managing schools and health clinics, solving local disputes, allocating land, maintaining law and order, and protecting rivers and forests.

Figure 9 reports summary statistics on traditional leaders' role as compared to those of the central and the local government across eight different functions. Traditional leaders are minimally involved in providing education, as well as health and sanitation, and have rather limited roles in policing (coined as "law and order" in the surveys), since the latter is the primary responsibility of the central government.

Question	Who Has the Primary Responsibility for:	Observations	Central Government	Local Government	Traditional Leaders	Community Members
		number	percentage	percentage	percentage	percentage
Q58a	Keeping the Community Clean	27,141	11.01	33.07	5.41	50.51
Q58b	Managing Schools	26,888	50.96	35.93	2.44	10.67
Q58c	Health Clinics	26,848	55.29	36.07	1.98	6.66
Q58d	Collecting Income Taxes	25,832	54.39	38.75	3.59	3.28
Q58e	Solving Local Disputes	26,719	18.37	36.20	32.28	13.15
Q58f	Allocating Land	26,391	28.33	39.10	25.49	7.09
Q58g	Protecting Rivers and Forests	25,389	48.29	29.20	9.26	13.25
Q58h	Maintaining Law and Order	26,550	65.88	21.30	6.88	5.94

Figure 9: Afrobarometer Surveys 2008
Primary Responsibility - Basic Functions

Ethnic leaders, however, have considerable power in solving local disputes (Figure 10a) and assigning property-land rights (Figure 10b). Thus, in line with the case studies and the anecdotal evidence presented in the previous section, tribal leaders exert significant influence on local economic activity, since they are prominent both in allocating land rights within the local community and providing judicial services. In the terminology of North (1981) it seems that in Sub-Saharan Africa ethnicity is instrumental in assigning and securing both property rights and contractual institutions.¹⁴

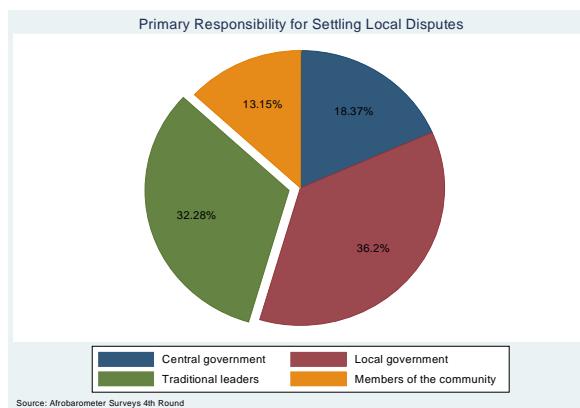


Figure 10a: Afrobarometer Surveys 2008
Primary Responsibility for Settling Disputes

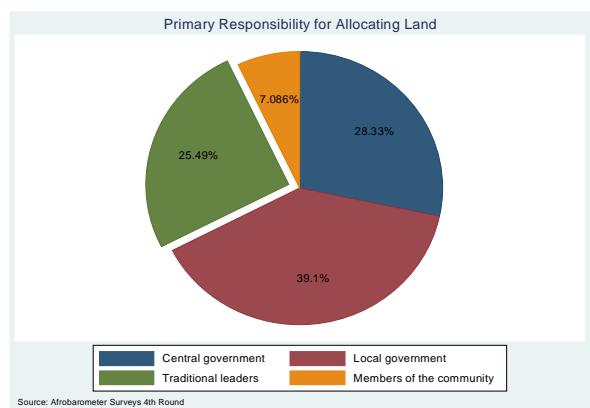


Figure 10b: Afrobarometer Surveys 2008
Primary Responsibility for Allocating Land

¹⁴ According to North (1981) "*property rights institutions*" protect citizens against expropriations from the government or powerful elites (that stem from a "*predatory theory of the state*"), while "*contractual institutions*" provide the legal (contractual and judicial) framework to facilitate economic transactions between individuals.

Given the primary role that the economics literature places on property rights and legal institutions (e.g., Acemoglu and Johnson (2005)) we further examined these two key responsibilities of traditional leaders. Figures 11a and 11b report the role of ethnic leaders in settling local disputes and allocating land rights by country. There is sizable heterogeneity. At the one extreme, in Malawi, Lesotho, Ghana, and Zimbabwe, the role of tribal leaders is fundamental and pervasive. This should not come as a surprise as in some of these countries customary courts and tribal leaders' role in solving local disputes is explicitly recognized by the state. Local chiefs also have considerable power in settling disputes and allocating land in Uganda, Mali, and Zambia. At the other extreme, in Tanzania, Madagascar, Benin and South Africa the role of ethnic leaders is small (though their popularity and influence is high).

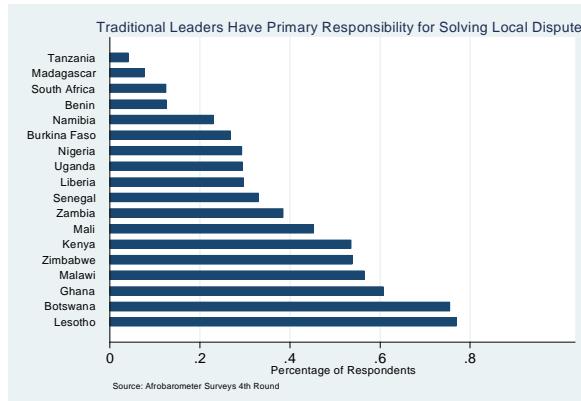


Figure 11a: Afrobarometer Surveys 2008
% of Respondents that Traditional Leaders have
Primary Responsibility for Settling Disputes

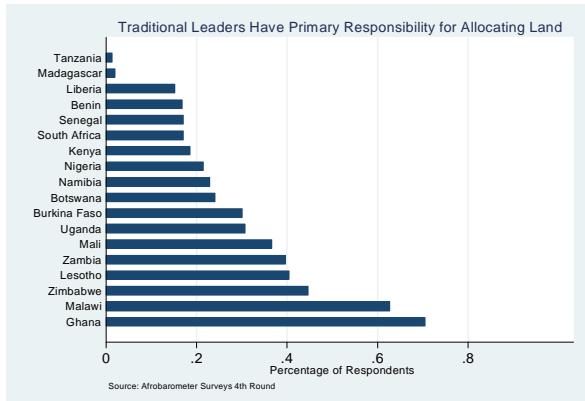


Figure 11b: Afrobarometer Surveys 2008
% of Respondents that Traditional Leaders have
Primary Responsibility for Allocating Land

Summary Using both case-studies and survey-based evidence this section illustrated the vibrant role of traditional leaders in the governance of local communities across Africa. Chiefs, however, do not operate in vacuum, but are embedded in ethnic-specific institutional frameworks. In the next sections we explore the institutional variation across ethnicities and investigate how these different legacies map into comparative economic development within and across African countries.

4 The Legacy of Pre-colonial Ethnic Institutions

This section sheds light on the importance and persistence of pre-colonial ethnic institutions. We start (in Section 4.1) by laying out the literature narrative that weaves political centralization to economic development and briefly review case studies pointing to the role of pre-colonial ethnic organization and political institutions. We then (in Section 4.2) portray political centralization at the time of European colonization and (in Section 4.3) trace the role of ethnic institutions

both during and after the colonial period. In Section 4.4 we discuss the channels via which ethnic-specific political institutions and traditional leaders determine development.

4.1 Political Centralization in the Context of Comparative Development

An influential conjecture in political economy regarding the roots of contemporary differences in economic performance holds that political centralization has played a fundamental role throughout human history. While there is a debate on whether development is mostly an outcome of geography (Diamond (1997)), culture (Landes (1998)), or institutions (Acemoglu and Robinson (2012)), most scholars tend to agree that politically centralized societies have been better positioned to provide a relatively secure environment for growth. Diamond (1997), for example, describes in detail how societies organized in large chiefdoms or complex states, had developed bureaucracies providing security, some form of property rights protection, and other basic public goods. Large chiefdoms and organized states tended to have centralized conflict resolution mechanisms with a monopoly in violence offering individuals access to a formal legal framework. Moreover, politically centralized groups developed tax and redistribution systems whose proceeds were used to finance wars and provide security (see Tilly (1985)).

Recently the economics literature has formalized these ideas and quantified the role of statehood in shaping economic and institutional progress (see Besley and Persson (2011) for a text-book treatment). Employing cross-country data, Bockstette, Chanda, and Puttermann (2002) and Puttermann and Weil (2010) show that contemporary development is positively correlated with a state antiquity index (constructed by measuring the years since 1AD that a region had some form of statehood). Africa's contemporary under-development (*vis-à-vis* Europe, Asia, and the Americas) has been linked to its relatively low levels of pre-colonial political centralization (Goody (1971)). In line with this idea available anthropological evidence shows a lower prevalence of politically centralized societies in Africa compared to Asia and Europe. And clearly Africa scores the lowest in Bockstette, Chanda, and Puttermann (2002) state antiquity index. Herbst (2000) synthesizes a vast literature in African historiography and political economy stressing that Africa did not develop many large organized states, mostly because population densities in pre-industrial African societies were lower compared to Europe.¹⁵ Partially as a result of relatively low pre-industrial population densities, inter-state conflict in Africa was low, compared to that in Europe or Asia, further impeding the strengthening and creation of empires and kingdoms (see Besley and Reynal-Querol (2014)).

¹⁵Fenske (2013) provides empirical evidence supportive to the "land abundance" view of African political institutions. Yet Osafu-Kwaako and Robinson (2013) show that the correlation between population density (or agricultural intensity) and political centralization in Africa is weak, while in Eurasia and the Americas the correlation is strong. Alsán (2014) documents that endemic infectious diseases caused by the tsetse fly have contributed to the low degree of political centralization and urbanization in Africa.

The Argument through the Tale of Two Countries The fundamental role of pre-colonial institutional endowments in shaping post-independence growth trajectories across African countries may be exemplified by contrasting the success story of Botswana to the disastrous case of Sierra Leone.¹⁶

Acemoglu, Johnson, and Robinson (2003) and Robinson and Parsons (2006), among others, attribute part of Botswana's success in securing property rights and providing a stable environment for economic activity to the inclusiveness of its pre-colonial institutions stemming from the strong state of the Tswana. Building on works by Schapera (1967, 1970) they note that Tswana chiefs were accountable to the local community both via local and inter-clan assemblies (*kgotlas*). In *kgotlas*, key issues were debated, and all adult males could participate and contribute to the arguments. Moreover, the Tswana king, while very powerful, was subject to checks and balances by senior chiefs, who in turn cooperated with local administrators and various advisory bodies. Perhaps not surprisingly, Botswana's relative post-independence success seems to be partly driven by the perceived legitimacy of the Botswana Development Party's government, which was seen as a continuation of the Tswana rule, based on pre-colonial chiefs, customs, and ethnic institutions (see also Hjort (2010)).

Turning now to a disaster case, Chaves and Robinson (2011) and Acemoglu, Chaves, Osafo-Kwaako, and Robinson (2014) argue that a part of Sierra Leone's post-independence devastating performance can be traced to the lack of large and politically complex kingdoms before colonization. Their narrative suggests that the absence of a centralized bureaucracy allowed the British to implement extractive policies using self-appointed paramount chiefs that were not accountable to the local community. Even after the British left local chiefs remained powerful as they became the main instrument for patronage politics. Traditional rulers continue to dominate politics in Sierra Leone by providing votes to the incumbent national party in exchange for safeguarding their legitimacy and role in local politics.

Early Case Studies Different legacies of pre-colonial political institutions have also been linked to comparative development *within* African states. In an important early contribution Douglas (1962) compares economic performance in the neighboring ethnicities of the Lele and the Bushong that are separated by the Kasai River in the Democratic Republic of Congo. She

¹⁶Sierra Leone and Botswana differ in many dimensions not just in the degree of pre-colonial political centralization. For example, the Alesina *et al.* (2003) index of ethnic fractionalization in Sierra Leone is 0.82, while for Botswana it is 0.41. Yet the ethnic polarization index of Montalvo and Reynal-Querol (2005) (a strong correlate of conflict) is similar in the two countries (0.14), whereas the fraction of the population of European descent is minimal in both countries. The location of these two countries is also different. Botswana is a landlocked country in Southern Africa, while Sierra Leone is on the coast of West Africa. This relative proximity to Europe and the Americas caused Sierra Leone to suffer disproportionately from slave trades (see Nunn and Puga (2012) for the differential effect of unfavorable geography in Africa and elsewhere and the role of the slave trades).

argues that the significant differences in well-being between the two ethnicities are driven by the different economic institutions that govern their exchange, production, and work ethos. Vansina (1978) also studies production, commerce, and the societal structure of the Kuba (Bushong) kingdom and compares it to that of nearby groups. He stresses the key role of the king and that of hereditary chiefs in providing security (via taxing) that sustained trade and commerce. The differences in development between the Kuba and neighboring groups seem to originate in the beginning of the 17th century when the Kuba king Shyaam laid the foundations of a strong state with several layers of governance by chiefs that were appointed by the king but also elected from local assemblies. Steadily a tax system and a formal legal institution emerged (see Acemoglu and Robinson (2012)).

4.2 Political Centralization in Pre-colonial Africa

Accompanying the relatively low degree of political complexity in Africa, there was significant heterogeneity in the forms of political organization across groups at the time of colonization.

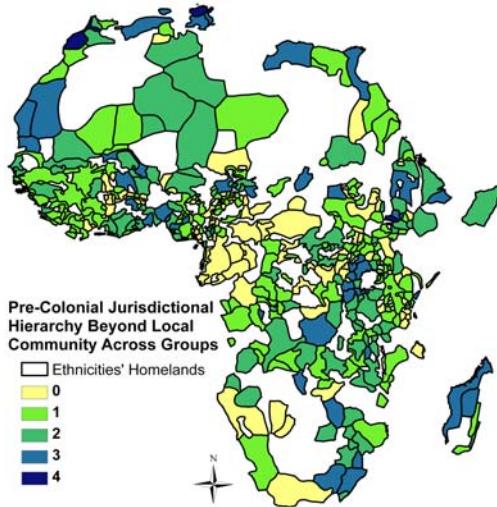


Figure 12 : Pre-colonial
Centralization across Groups

In an early study of African societies, Fortes and Evans-Pritchard (1940) categorize ethnic groups into two broad political systems. "*One group consists of those societies which have centralized authority, administrative machinery, and judicial institutions-in short, a government-and in which cleavages of wealth, privilege, and status correspond to the distribution of power and authority. This group comprises the Zulu, the Ngwato, the Bemba, the Banyankole, and the Kede. The other group consists of those societies which lack centralized authority, administrative machinery, and judicial institutions-in short which lack government-and in which there are no sharp divisions of rank, status, or wealth. This group comprises the Logoli, the Tallensi, and the*

Nuer." On that classification Diamond (1997) adds an intermediate case of groups organized as chiefdoms or loose alliances where some state features were present.

George Peter Murdock (1967) assembled a comprehensive dataset on the cultural, political, and economic features of a large cross-section of ethnic groups around the world. Using a variety of sources, Murdock (1967) attempted to document the societal features of groups in Africa (and the New World), prior to contact with Europeans. The fruits of this major effort are recorded in an *Ethnographic Atlas* (published in twenty-nine installments in the anthropological journal *Ethnology*) reflecting cultural, geographical, and economic characteristics of 1,270 ethnicities.

Figure 12 maps Murdock's (1967) "Jurisdictional Hierarchy beyond the Local Community Level" index across African homelands using the spatial distribution of ethnicities from his earlier work (Murdock (1959)). This proxy of political centralization describes the number of political jurisdictions above the local (usually village) level for each group. A zero score indicates stateless societies "*lacking any form of centralized political organization*". A score of 1 indicates small chiefdoms. A score of 2 designates paramount (large) chiefdoms; and 3 and 4 indicate groups that were part of large states.

He classifies as "centralized" the dominant ethnic groups of the major pre-colonial African states. For example, the Ankole, the Banyoro and the Buganda, which were the central groups in the kingdoms of Eastern Africa, get a score of 3. The same applies to other ethnicities that were part of large empires, such as the Zulu and the Swazi in what is today South Africa, the Yoruba in Nigeria, and the Shongai in Mali. Murdock's classification seems appropriate for stateless societies as well. The jurisdictional hierarchy index equals zero or one for the Amba, the Konkomba, the Tiv, the Dinka, and the Lugbara, in line with case-study evidence that identifies them as acephalous (fragmented) societies without any degree of political centralization. He assigns an intermediate level of political centralization (paramount chiefdoms and small states), to groups like the Ashanti that were part of a loose confederation, as well as the Kuba in Congo, the Bemba in Zambia, and the Egba in Nigeria that all had some centralized authority.

4.3 Institutional Persistence

But are these deeply rooted ethnic political institutions still relevant? Ethnic institutions have endured mainly for three reasons. First, in the majority of cases Europeans did not alter pre-existing local political (and social) structures, as colonization was (with some exceptions) quite limited both regarding timing and location. European settlements in Africa were confined in the capitals and power was mostly broadcast by a small number of local administrators. With the exception of South Africa, when the initial colonial settlements took place in the 18th century, colonization in the coastal regions of Western Africa started around 1860–1870 and then spread to

Central and Eastern Africa. The drawing of colonial boundaries that partitioned the continent into spheres of influence, protectorates, and colonies was completed by the turn of the 20th century. The colonial era officially ended with the wave of African independence in the early 1960s, but the influence of Europeans had already started weakening after the Second World War.

Second, as Mamdani (1996) eloquently argues, in several occasions Europeans strengthened the role of tribal chiefs and kings via their doctrine of indirect rule. While European strategies towards the local population and the policies of indirect rule differed across (but also within) colonizing powers, to some extent colonial administrators relied on local administrators. Examples include the system of chiefship in Sierra Leone, and the introduction of warrant chiefs in the Igbo regions in Southern Nigeria, a group lacking political centralization. Both were established by the British during the colonial era and remain largely in place today. Similarly, Davidson (1992) and others present case studies where colonizers reinforced ethnic identities by tailoring indirect rule along ethnic lines.¹⁷

Third, the African governments upon independence found it extremely difficult to effectively govern rural areas beyond the capitals and a handful of large urban centers. This was due to the limited infrastructure passed on by the European colonizers and the artificial border design. As a result, Africans, especially those residing in the periphery, continued relying upon ethnic-specific structures rather than the national government (Englebert (2009)). For example, Herbst (2000) notes that in Mauritania, Mozambique, Niger, Nigeria and Chad, while the first post-independence national governments tried to marginalize traditional leaders, the national authorities soon realized the extraordinary difficulties in administering rural areas and formed alliances with local tribal chiefs.

4.4 Channels

The African historiography has proposed various mechanisms via which ethnic institutional structures shape contemporary economic activity. First, many argue that in centralized societies there is a relatively higher degree of accountability of local chiefs, as compared to stateless ethnic groups or societies organized in small chiefdoms (Herbst (2000), Boone (2003)). In large chiefdoms and organized states there were many bureaucratic layers, and as such local leaders were monitored by superior chiefs and in some cases hereditary monarchs (kings and emperors).

¹⁷The most illustrative example comes from the German and mostly Belgian policies in Rwanda and Burundi. Initially colonizers strengthened the role of Tutsi chiefs, who were ruling the pre-colonial states of Burundi and Rwanda, by (a) institutionalizing Tutsi supremacy, (b) extending their authority even in areas where Hutu chiefs were ruling, (c) removing local petty chiefs and extending the power of (approximately 65) paramount chiefs (Reyntjens (1987)), and (d) impeding access of most Hutus to the limited public goods (Nkurunziza and Ngaruko (2008)). Moreover, in 1933 – 1935 the Belgian administrators issued identity cards labelling locals as either Tutsi, Hutu, Twa or naturalized; this turned out to have disastrous consequences during the 1994 Rwandan genocide.

Moreover, many centralized ethnic groups had local assemblies where key policy issues were deliberated. In many instances these structures endured the colonial era and post-independence nation-building process. For example, Englebert (2002) describes how the old-kingdom of the (Bu)ganda reemerged after the 1993 Constitutional amendment in Uganda which explicitly recognized traditional authorities. The Buganda kingdom has its own administrative apparatus with the *kabaka* (king) as its supreme leader, local chiefs (*saza*) ruling the eighteen traditional counties (*amasaza*), and sub-ordinate chiefs responsible for smaller administrative units. The Buganda have also their own envoys in countries with large Ganda communities, such as in the United Kingdom and Sweden. Likewise, Mamdani (1996) discusses the high degree of accountability of the Zulu king and the superior chiefs at the time of colonization, describing the quite elaborate checks and balances in the organization of the other Southern African centralized ethnicities, such as the Swazi and the Tswana.

Second, in centralized ethnicities there was access to some formal legal resolution mechanism and some form of property rights steadily emerged (Herbst (2000)). Schapera (1970) presents evidence that the Tswana had elaborate legal rules, courts and detailed procedures for conflict resolution. Importantly, even chiefs were subject to the law. The limited presence of the British colonizers in Bechuanaland helped the endurance of these courts and the culture of the rule of law that are present nowadays. Similarly, Hjort (2010) notes that Botswana courts have ruled for the (minority) Bushmen San people, against the government's decision to evict them from their (diamond rich) historical homeland. Baldwin (2013) shows that across Zambian regions there is a strong positive correlation between political centralization and the power of traditional leaders in administrating land. In line with this, Fenske (2013) presents cross-sectional estimates from the Standard Cross Cultural Sample that covers 186 ethnicities around the world showing that centralized groups are more likely to have a judiciary system, police, as well as a formal administrative bureaucracy.

Third, Schapera (1967) and others have argued that centralized societies benefited disproportionately from the presence of the colonizers. For example, in Eastern Africa British authorities collaborated with the king of the Buganda in order to split the kingdom's land that was under communal customary law between colonizers and local chiefs (Englebert (2002)). Moreover, in some cases Europeans settled and invested in the homelands of the more politically advanced groups magnifying any pre-existing differences in well-beings across ethnicities (e.g., Huillery (2009), Huillery (2011), Arbesu (2011), and Jedwab and Moradi (2012)).

Fourth, tribal societies with strong political institutions have been more successful in obtaining concessions both from colonial powers and from national governments after independence. For example, Acemoglu and Robinson (2012) describe how the Tswana leaders travelled from

Bechuanaland to England and convinced the British government to allow for a greater degree of autonomy. The success of the Tswana leaders was driven to a great extent by the legitimacy of their institutional reach.

5 Empirical Evidence

In this Section we report on recent econometric studies that employ regression techniques to explore the role of pre-colonial ethnic political institutions on comparative development. We start our analysis by illustrating the cross-country data patterns. We then discuss the empirical findings of Michalopoulos and Papaioannou (2013b) linking pre-colonial political centralization to contemporary development, as captured by satellite images of light density at night across ethnic homelands.

5.1 Cross-Country Evidence

Gennaioli and Rainer (2007) use Murdock's jurisdictional hierarchy index to construct cross-country measures capturing the degree of pre-colonial political centralization. They distinguish between "fragmented" societies, being either stateless or organized as petty chiefdoms and "centralized" ones, defined as those organized in paramount chiefdoms or states. Then, they estimate for each country the percentage of the population that comes from politically centralized groups (i.e., where the jurisdictional hierarchy index is 2, 3 or 4). Their analysis shows that countries historically lacking strong pre-colonial political centralization, such as Liberia and Sierra Leone, have lower immunization rates, lower educational attainment, and higher infant mortality rates compared to countries historically populated by politically centralized ethnic groups, such as Lesotho, Swaziland, and Rwanda. Gennaioli and Rainer (2006) further show that countries originating from ethnic groups with centralized pre-colonial political institutions tend to score higher in proxies of national institutional quality (such as property rights protection and a composite rule of law index) as compared to countries that lacked strong states at the time of colonization. Both results are robust to various country-level controls even when the authors condition on the log of per capita income during independence (to account for the level of development at the end of colonization).

Figures 13a – b illustrate the cross-country association between the average political centralization before colonization and contemporary economic and institutional development. Using Murdock's data on the jurisdictional hierarchy index we construct a population weighted country index of the complexity of pre-colonial political institutions and then associate this index with the log of per capita GDP in 2000 (from the Penn World Tables) and a composite index reflecting the control of corruption from the World Bank's Governance Matters Database (Kauf-

mann, Kraay, and Mastruzzi (2005)). Figure 13a reveals a weak positive association between pre-colonial political centralization and economic development. Alsan (2014) shows that this correlation is strengthened once one accounts for colonizer and legal origin effects; moreover, she shows that the positive association between pre-colonial political centralization and log per capita GDP in 2005 is robust to the inclusion of controls capturing geography and the historical legacy of slavery. Figure 13b reveals a strong correlation between pre-colonial political centralization and contemporary institutional quality, as reflected in the control of corruption index, implying some significant institutional persistence (the results are similar with other proxy measures of national institutions, such as bureaucratic quality and rule of law).

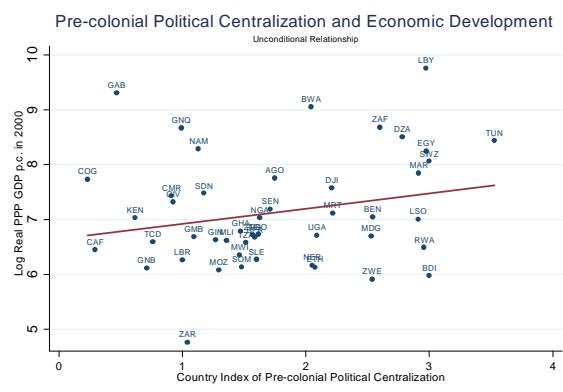


Figure 13a: Pre-colonial Political Centralization and Comparative Development

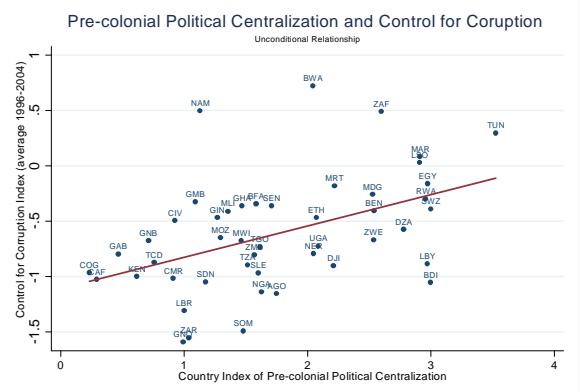


Figure 13b: Pre-colonial Political Centralization and Control of Corruption

5.2 Ethnic Homeland Analysis

Michalopoulos and Papaioannou (2013b) examine the role of pre-colonial ethnic-specific political institutions on economic development exploiting within-country regional variation. They perform the analysis at the ethnic homeland level, exploiting the fact that there were sizable differences in pre-colonial political centralization even within the boundaries of contemporary states. This approach has some straightforward benefits. First, one may effectively account for colonial features related to the identity of the colonizer or/and the type of colonization and post-independence nationwide features, such as macroeconomic (and other) policies, the role of formal institutions, foreign aid, and other factors. Second, by performing the analysis at the regional level, one can account for local geographic, ecological, and other traits (related, for example, to natural resources and early development) and thus isolate the role of ethnic local institutions on development. This is non-trivial since there is a fierce debate over whether the strong cross-country association between institutional and economic development reflects a causal relationship or is driven by hard-to-quantify geographical features.

5.2.1 A New Proxy of Development: Satellite Light Density at Night

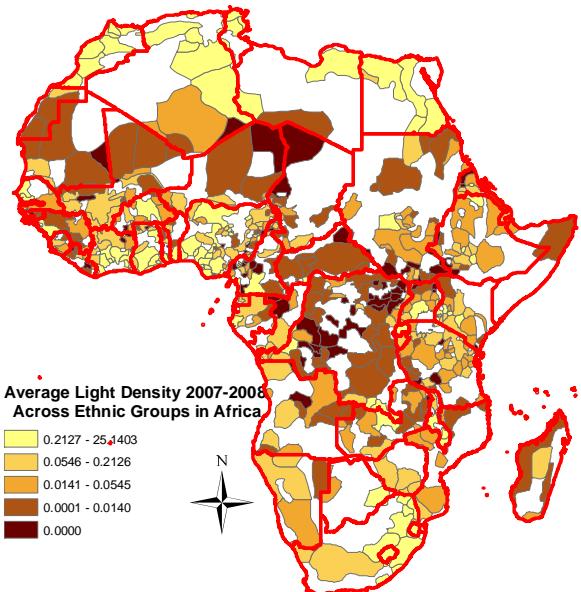


Figure 14a: Luminosity at the Ethnic Homeland

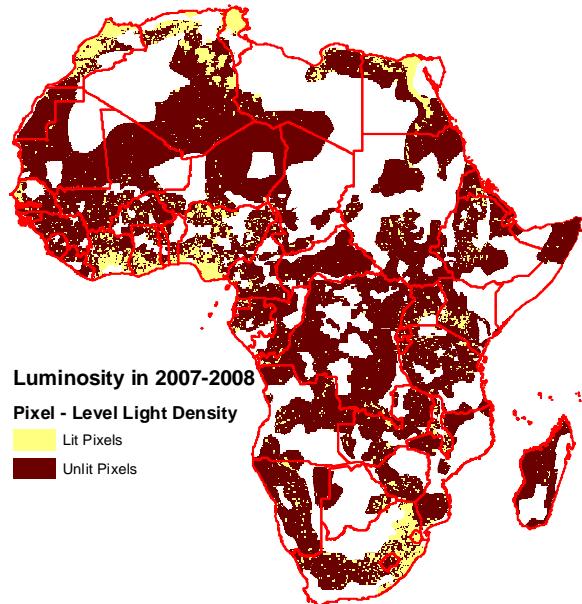


Figure 14b: Pixel-Level Luminosity

The nature of the study requires detailed data on economic performance at the ethnic homeland level (e.g., the region where the Maasai traditionally reside in Northern Tanzania and in Southern Kenya). Yet spatially disaggregated economic indicators are not available for most African countries. To overcome this issue the authors follow Henderson, Storeygard, and Weil (2012) and use satellite images on light density at night to proxy economic development at a fine grid. Using these data they construct average light density per square kilometer averaging across all pixels falling in each ethnic homeland in each country in 2007 and in 2008. Henderson, Storeygard, and Weil (2012), as well as previous studies (e.g. Elvidge, Baugh, Kihn, Kroehl, and Davis (1997); Doll, Muller, and Morley (2006)) and subsequent works (Chen and Nordhaus (2011), Pinkovskiy (2013), Michalopoulos and Papaioannou (2014)) show that light density at night is a strong proxy of economic activity at various levels of aggregation.¹⁸

Figures 14a and 14b portray the distribution of luminosity across African ethnic homelands. In Figure 14a the luminosity data is aggregated at the country-ethnic homeland level, while in Figure 14b the continent is divided into pixels of 2.5×2.5 decimal degrees (approximately $12.5\text{km} \times 12.5\text{km}$) indicating lit and unlit pixels. There is sizable variation in light density across regions with luminosity being significantly higher in Southern African countries and the coastal areas of Western Africa as compared to the desert areas in Sahara and the rainforest in Central Africa.

¹⁸In the Appendix we present graphical analysis illustrating the strong correlation between luminosity and various proxies of development across and within African countries.

5.2.2 Econometric Evidence

Preliminary Evidence Before we proceed to the formal regression evidence, we explore the main data patterns. Figure 15 tabulates means and medians of luminosity for each type of pre-colonial political organization.

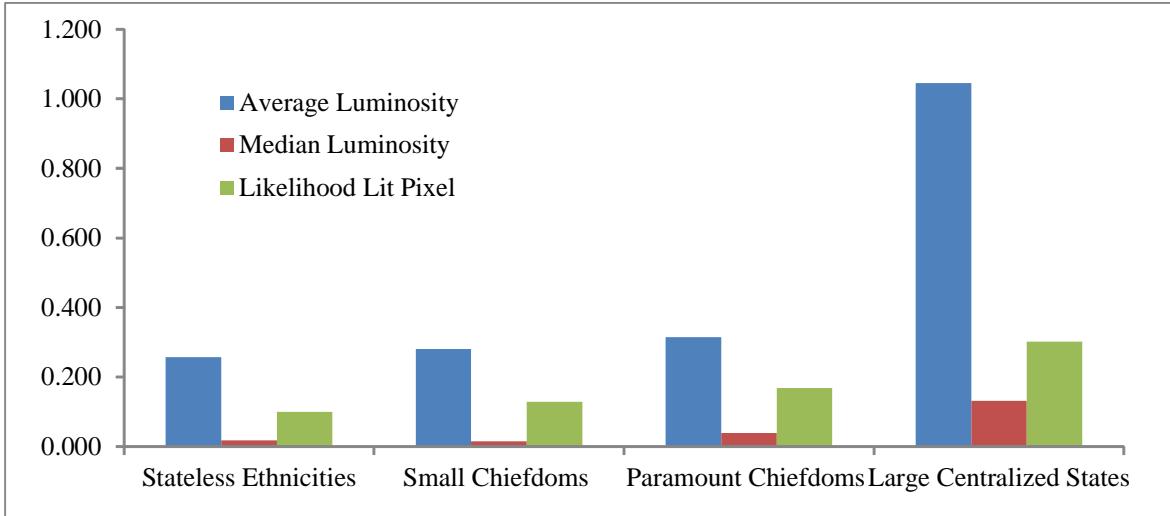


Figure 15: Luminosity Summary Statistics

On the one hand, the mean (median) luminosity in the homelands of stateless societies is 0.257 (0.018) and for petty/small chiefdoms the mean (median) value is 0.281 (0.015). On average 10% and 12.9% of populated pixels falling in the historical homeland of stateless groups and petty chiefdoms are lit, respectively.

On the other hand, the average luminosity across groups that pre-colonially formed large paramount chiefdoms is 0.315. While the difference is small when we compare the median values large and significant differences emerge. The median luminosity for paramount chiefdoms is more than three times larger as compared to stateless ethnicities or groups organized in small chiefdoms, 0.039. Moreover, the difference in the likelihood that a pixel is lit is 6.9% higher for groups that are paramount chiefdoms as compared to stateless societies (this difference is statistically significant at the 95% level). Average luminosity in the homelands of ethnic groups that were part of large centralized states before colonization is 1.05, four times larger than luminosity of stateless societies or small chiefdoms. On average 30.2 percent of populated pixels falling in the homelands of highly centralized groups are lit, three times more than the likelihood that a pixel is lit for stateless societies. The median value of luminosity in this group of ethnicities is 0.082, four times larger than the respective median for societies solely organized at the local community level or ethnicities with weak inter-community political ties (petty chiefdoms). Luminosity in the ethnic homelands of pre-colonial states is significantly higher, even when compared to luminosity

at the homeland of groups organized as paramount chiefdoms. Simple test of means suggest that these differences are statistically different than zero at the 99% confidence level.

Baseline Estimates However, both pre-colonial political centralization and luminosity capture common factors. Therefore, the key question is whether differences in light density are related to the degree of pre-colonial political institutions, conditional on population density and other related factors. Figure 16 summarizes the key findings of Michalopoulos and Papaioannou (2013b). In all (linear) specifications the dependent variable is an indicator (0–1) that equals one if a pixel is lit and zero otherwise.¹⁹ Since a significant fraction of the continent is unpopulated, we restrict estimation to populated areas (the results are similar if we include unpopulated pixels). In all specifications the omitted category is stateless upon colonization societies. So, green bars plot the likelihood that a pixel falling in the historical homeland of small chiefdoms is lit as compared to stateless groups. Similarly, light blue and dark blue bars plot the likelihood that a pixel is lit in large chiefdoms and organized states, respectively.²⁰

Model 1 reports coefficient estimates on the three types of political organization, simply conditioning on country fixed effects; this accounts for all time-invariant country-specific factors, related to the identity of the colonizer, the type of colonization, post-independence national policies and all other nation-wide factors. Compared to stateless societies, development is higher in the homelands of societies organized as small chiefdoms; yet the difference is small, around 3.5%, and statistically indistinguishable from zero. Differences are large when we compare politically acephalous groups to ethnicities that in the pre-colonial era were parts of paramount chiefdoms or large kingdoms. The coefficient for the groups of ethnicities that formed large states in the pre-colonial era implies that the likelihood that a pixel is lit is 13 percentage points higher as compared to the group of societies that lacked any state features at the time of colonization.

In models 2 we condition on the log of population density in 2000 (using georeferenced population estimates from the United Nations Environmental Programme).²¹ Accounting for population density is important because research shows that there is a strong interplay between political centralization and urbanization (Stevenson (1968)).²² While the coefficient for groups organized as large chiefdoms or states declines, the estimates retain their statistical significance, implying that contemporary development is significantly higher in the homelands of ethnicities

¹⁹Overall the analysis is carried out in a sample of 66,570 pixels.

²⁰Since there are just two ethnic groups where the jurisdictional hierarchy index equals four, these ethnicities are assigned into the group where the jurisdictional hierarchy index equals 3.

²¹The UNEP dataset imputes population at the grid level using information on roads, railroads, navigable rivers, and urban centers.

²²It should be stressed, however, that while across the globe there is a strong positive correlation between historical population densities and political centralization, the correlation in Africa is positive but much weaker (Osafu-Kwaako and Robinson (2013)).

with strong politically complex institutions at the time of colonization.

In model 3 we also include in the specification a rich set of conditioning variables to account for local geographic, ecological, and other characteristics. Specifically, we add indicators capturing the presence of diamond mines, petroleum fields, and water bodies at the pixel-level. We also control for the distance from the centroid of each pixel to the sea coast, the capital city, and the national border; and we also add controls for land suitability for agriculture, elevation, surface area, and a malaria stability index.²³ In model 4 we also condition on the same variables at the country-ethnic homeland-level. We continue to find that regional development is systematically linked to pre-colonial ethnic institutions. The estimates show that differences in luminosity become economically and statistically significant when one compares paramount large chiefdoms to either stateless societies or groups organized as petty chiefdoms. Contemporary development is even higher in regions historically populated by societies that were part of large states at the time of colonization. The most conservative estimates imply that the likelihood of a lit pixel is approximately 7 percentage points higher when one moves from the homeland of stateless ethnicities to regions where highly centralized ethnic groups reside. This effect is far from being small, as in the sample only 16.7% of all populated pixel areas are lit.

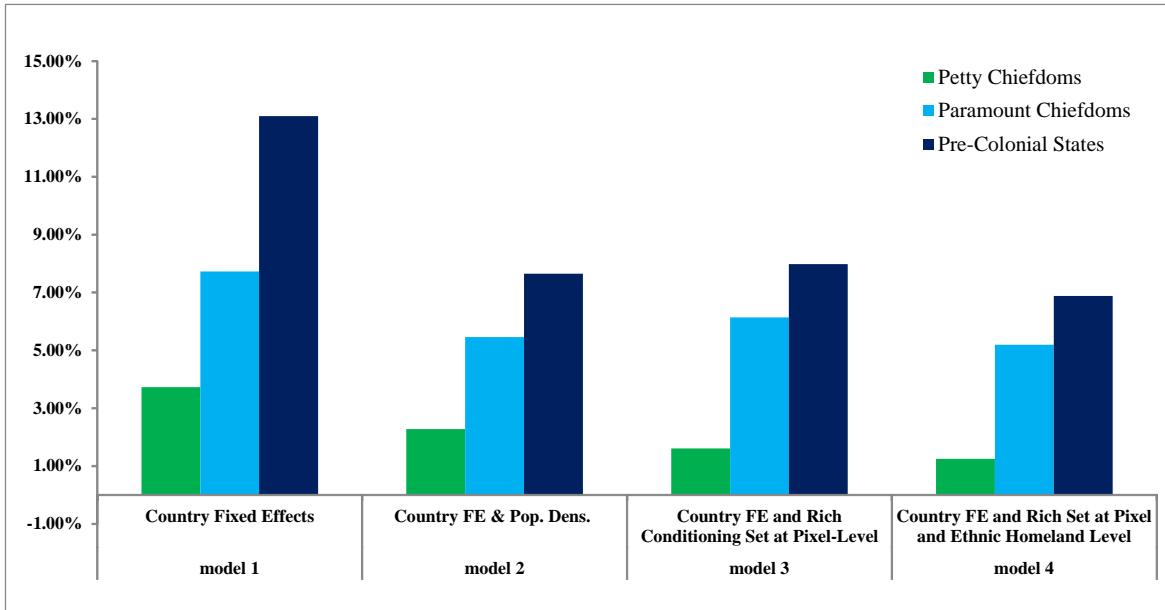


Figure 16: Summary of Econometric Results
Michalopoulos and Papaioannou (2013)

A couple of examples are useful to illustrate the results. In Botswana approximately 5.5% of pixels that fall in the historical homeland of the Naron and the Kung, two stateless

²³Not all pixels have the same surface area since pixels by the coast, lakes, and ethnic boundaries, are smaller.

societies, are lit. In contrast, there is a 28% likelihood of a lit pixel falling in the homeland of two centralized groups, the (Ba)Ngwato, a traditional Sotho-Tswana tribe and the Ndebele, that originate from the Zulus. In Nigeria, approximately 20% of all populated pixels falling within the boundaries of groups that were stateless upon colonization (such as the Tiv) are lit; in contrast, in the homeland of ethnic groups that were organized as large paramount chiefdoms (such as the Hausa) the likelihood that a pixel is lit is 39%, while in the homelands of ethnic groups organized in large kingdoms and states (such as the Ife or the Yoruba) the likelihood is close to 50%.

Given our discussion of a dual institutional-economic structure in Africa reported in the previous section, we estimated models focusing on homelands outside the capital cities where due to population mixing and the strong influence of national institutions (Michalopoulos and Papaioannou (2014)), ethnic traits should play no role. Figure 17 reports otherwise identical to Figure 16 estimates but excluding from the estimation pixels close to the capital cities. In particular we use the 25th percentile of distance to capital (236.645 kilometers) as a cutoff to distinguish between proximate and far from the capital city areas. (The results are similar if we use the median distance to the capital or we use the 10% percentile). In all models the coefficients on the binary (dummy) variables identifying large states pre-colonial states, paramount and even petty chiefdoms are positive and highly significant, implying that regional development is significantly higher in those homelands as compared to pixels falling in the ancestral homelands of acephalous societies.

Most importantly all coefficients are larger than the analogous estimates in the full sample (see Figure 16). For example in the most restrictive specifications (model 4) the coefficients on petty and paramount chiefdoms are 0.0386 and 0.068, respectively, while the estimate on large pre-colonial states is 0.1, while the corresponding estimates in the full sample are considerably smaller, 0.0125, 0.052, and 0.069. This estimate implies that the likelihood that a pixel is lit is 10% if it falls in the historical homeland of a group that was organized as a state in the pre-colonial era as compared to groups without any level of political centralization beyond the local level. This effect is three percentage points larger than the implied impact in the full sample. Note that the likelihood that a pixel is lit in the sample outside the vicinity of capitals is lower (13.6%) implying even larger estimates. In contrast, when we restrict estimation to pixels (or homelands) close to the capitals there is no systematic link between pre-colonial institutions and pixel-level development, as reflected in luminosity (results not shown for brevity). This further demonstrates the dual structure of economic-institutional development in Africa, where ethnic institutions matter in areas far from the capitals where national institutional features are immaterial, while ethnic institutions are irrelevant for development in the vicinity of capitals where national institutions are present.

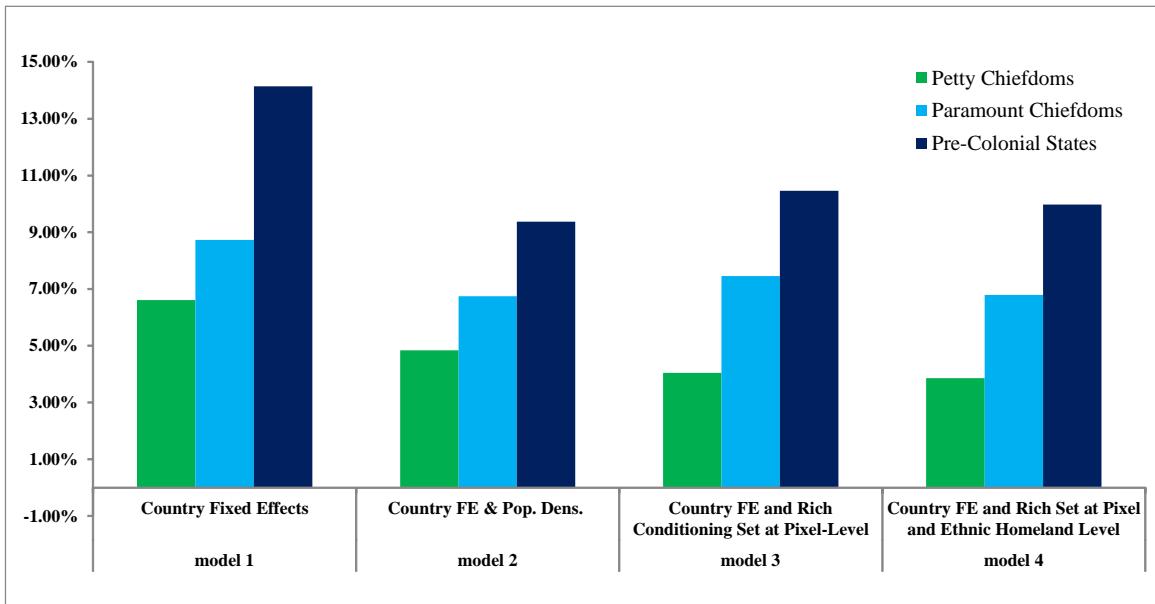


Figure 17: Further Evidence
Estimates Far from the Capitals

Further Evidence and Sensitivity Checks Since pre-colonial political institutions are not randomly assigned, one cannot claim that the estimates from the empirical analysis are causal. There are three main issues. First, the degree of political centralization is likely to capture other features of pre-colonial societies, such as historical urbanization,²⁴ social stratification, the type of economic activity, settlement patterns, etc. (see Diamond (1997)). To partly account for this we regressed luminosity on the jurisdictional hierarchy index and more than twenty other variables from Murdock's Ethnographic Atlas capturing the type of economic activity (dependence on agriculture, hunting, fishing, animal husbandry, and milking of domesticated animals), societal arrangements (polygyny, presence of clans at the village level, slavery), early development (size and complexity of pre-colonial settlements), and proxies of local institutional arrangements (an indicator for the presence of inheritance rule for property, elections of the local headman, class stratification and jurisdictional hierarchy at the village level). In all specifications the jurisdictional hierarchy beyond the local community level index enters with a positive and stable coefficient. Moreover, across all permutations the coefficient is significant at standard confidence levels, suggesting that it is political centralization and statehood rather than some other observable societal features that influence long-run development.

²⁴Since there are not much data on pre-colonial urbanization in most specifications we control for contemporary population density. To account for the "bad control" problem of Angrist and Pischke (2008), we also conditioned on log population density using the first post-independence census, finding similar and if anything- somewhat stronger results.

Second, the estimates may be driven by some unobserved hard-to-account-for factor either related to local geography or pre-colonial economic development. This is a much harder issue to address. Yet in an effort to account for it, we estimated empirical specifications associating development with pre-colonial ethnic institutions within pairs of adjacent ethnicities with a different degree of political complexity in the same country. For example, in Uganda the Acholi, a group organized as a small chiefdom at the time of colonization, borders the (Ba)Nyoro, the group that dominated a strong pre-colonial kingdom in East Africa. In Burkina Faso, the homeland of the Mossi, the dominant ethnic group of the pre-colonial Mossi empire is adjacent to the homeland of the Samo, an ethnicity that at the time of colonization lacked any level of political authority beyond the local community level. We thus compare development across 252 pairs of adjacent ethnic homelands comprising a centralized and a non-centralized ethnicity. The estimates imply that on average within contiguous ethnic homelands falling in the same country, the probability that a pixel is lit is approximately 3% higher in the homeland of ethnic group that was organized as a large chiefdom or state. Moreover, note that if it was the case that some hard-to-account-for geographic characteristics were behind the observed association between political centralization and regional economic performance then one would find the same positive relationship even in places where pre-colonial ethnic traits are probably irrelevant today. This is likely the case for regions in the vicinity of the capital due to ethnic mixing and the strong presence of the national state. Hence, we view the finding that ethnic-specific political centralization does not correlate with regional development nearby the capital cities as further evidence that pre-colonial centralization does reflect the influence of ethnic-specific institutional actors.

Third, Murdock's data surely contain noise, as for example Murdock assigned each African region to a single ethnic group, while to some extent at least ethnicities overlap. Moreover, Murdock's map is bound to have drawing error on the exact boundaries, which in any case are just approximations given the limited capacity of pre-colonial African states to broadcast power (Herbst (2000)). Yet in the presence of classical error-in-variables the estimates in Michalopoulos and Papaioannou (2013b) will be conservative due to attenuation bias (Wooldridge (2002)). Alsan (2014) constructs regional proxies of pre-colonial ethnic institutions combining Murdock's jurisdictional hierarchy beyond the local community index with *Ethnologue*'s contemporary maps on the linguistic composition of African regions. Her painstaking approach yields more accurate measures of ethnic-specific pre-colonial political centralization across administrative units in Africa. Not only her method lowers noise due to the relocation of ethnic groups, but also partially accounts for population mixing (that is a key issue in capitals). She shows that there is a strong positive association between pre-colonial ethnic political centralization and development (as proxied in log luminosity) at the regional level. Interestingly her estimates on pre-colonial

political centralization are way higher (and more precisely estimated than ours) in line with measurement error interpretation. In line with this, in Michalopoulos and Papaioannou (2013c) we show that once one combines Murdock's data with alternative maps of pre-colonial statehood in an effort to account for measurement error the magnitude of the estimated coefficients increases.

Additional Evidence Fenske (2014) presents further evidence supportive of the idea that deeply-rooted ethnic political centralization contributes to contemporary development. He first shows that pre-colonial states emerged in areas with heterogenous geography, most likely because centralized bureaucracies and policing were needed to foster trade (see also Bates (1983) and Michalopoulos, Naghavi, and Prarolo (2012)). He then shows that the (semi-exogenous) component of political centralization that is driven by ecological diversity is also positively correlated with luminosity at the ethnic homeland level. While ecological diversity and propensity to trade may exert an independent effect on regional development, this result points out that historical political institutions exert a significant long-run influence. Most importantly Fenske (2014) reports quantitatively larger two-stage-least-squares estimates, hinting that the OLS estimates in Figure 15 constitute conservative lower bounds (due to attenuation). Likewise, Alsan (2014) shows that the component of pre-colonial political centralization that is driven by soil-climate suitability for the Tse-Tse fly is also a strong correlate of regional development; and while Tse-Tse ecology may shape development (as captured in log luminosity) through other channels, she shows that this does not seem to be the case.

Bandyopadhyay and Green (2012) examine the role of pre-colonial political centralization on development and public goods provision using detailed survey data from Uganda at the district (96 observations) and the county level (close to 1,000 observations). They show that literacy, income and a composite human development index are higher in the homelands of politically centralized ethnic groups. When the authors account for the fact that the ethnic institutions may be less relevant for areas far from the center of politically centralized groups, they tend to find stronger results. Interestingly, Bandyopadhyay and Green (2012) fail to detect a systematic association between the degree of pre-colonial political centralization and proxies of public goods provision, this result appears in line with the descriptive patterns from the Afrobarometer surveys (in Section 2), showing that traditional leaders have rather limited responsibility for local public goods provision.

In recent work Depetris-Cheuvrin (2014) constructs a state-antiquity/centralization index at a cell-level (approximately at pixels of $10 - 12 \text{ km}^2$) and uses georeferenced data on civil conflict to uncover a negative relationship between long-run exposure to statehood and contemporary conflict.²⁵ Using data from the Afrobarometer Surveys, he then shows that individuals residing

²⁵ Similarly, Wig (2013) shows that politically centralized groups are less likely to engage in civil war when they

in regions with a long state history are more likely to accept the key institutions of the national state, such as the power of courts, the tax authorities, and the police. Moreover, state history is positively related to chief's role in the local communities.

The link between ethnic-level political centralization and development seems to be also present outside Africa. Focusing on North America, Dippel (2014) shows a strong positive correlation between the degree of pre-colonial political centralization of indigenous tribes and contemporary development across indigenous Native American Reservations. Focusing on Latin America Chiovelli (2014) documents a positive correlation between pre-colonial institutions and contemporary levels of development, as measured by light density at night and population density. His work also reveals a significantly positive effect of pre-colonial centralization on sub-national colonial institutions, suggesting that the significant reduced-form association between pre-colonial political centralization and development captures (to some extent) their role in shaping colonial institutional structures.

6 Conclusion

Summary This study highlights recent explorations of the political economy of African development that place an emphasis on ethnic-specific institutional and other traits.

We start our paper reviewing the latest wave of studies stressing the limited fiscal and legal capacity of most African countries and the limited role that national governments play in areas far from the capitals. We then link this body of work to survey evidence showing the salience of ethnic identification, which is widespread across the continent. These findings suggest that the focus on nationwide factors as the key driver of economic success has perhaps overlooked a critical feature of the African landscape, namely the role of ethnicity.

We then discuss the literature on traditional leaders (chiefs) in Africa. Unlike national politicians and public administrators, ethnic authorities and traditional leaders enjoy widespread support among their peers. Chiefs have considerable *de jure* and *de facto* authority in many aspects of local economic, political, and social life, most importantly in handling local disputes and assigning land property rights.

Ethnic-specific institutions are not a recent development, in fact they are rooted in the pre-colonial past of the groups. Using anthropological data on the spatial distribution of ethnicities and the degree of political centralization at the time of colonization, we show that there is significant heterogeneity in ethnic-specific historical institutional arrangements. The spectrum ranges from ethnic groups that were organized effectively as states having a centralized bureaucracy, layers of administration, and formal legal institutions to acephalous (fragmented) societies that

are excluded from the central government.

practically lacked any form of political integration beyond the village level. Colonization did not significantly alter ethnic institutions, as it was short-lived and Europeans mostly settled in the handful of capital cities near the coast and waterways. Moreover, in some instances Europeans institutionalized the role of local chiefs as a by-product of their indirect rule policy.

In the final section we review recent empirical works showing that ethnic pre-colonial institutions correlate significantly with contemporary development across countries. We then discuss the study of Michalopoulos and Papaioannou (2013b) and subsequent studies linking pre-colonial political centralization to ethnic-specific economic development, as reflected in satellite images of light density at night. The analysis reveals a strong positive association between ethnic institutions and economic development, even when one accounts for colonial and national features, geography at a fine level, and numerous other ethnic-specific traits. Since there is no random assignment of ethnic institutions, this correlation does not necessarily imply causation. Yet the results provide large-scale formal econometric evidence in support of the African historiography that emphasizes the importance of ethnic institutions and other historical features in shaping contemporary economic performance. We also report new results showing that the link between pre-colonial political centralization and regional development, as reflected in luminosity, is particularly strong outside the capital cities (where national institutions are relevant, Michalopoulos and Papaioannou (2014)).

Future Work We view this study as a stepping stone for further research in documenting and understanding the "dual" economic-political structure of African societies where ethnic and national institutions seem to coexist. For example, the Afrobarometer Surveys cover roughly half of the continent's countries. However, no surveys were conducted in many war-prone and politically unstable ones, such as the Democratic Republic of Congo and Sudan where anecdotal evidence suggests that (perhaps due to the state collapse) ethnic identity is particularly salient. Moreover, although *a priori* there are several possible channels via which pre-colonial political centralization may be beneficial for development, the available studies are silent as to the relevant magnitudes. Examining heterogeneity is thus needed, as this can shed light on the mechanisms at play. Subsequent empirical research should try disentangle the mechanisms at work and enrich the dimension of cultural identity by investigating how ethnicity, language and religion interact to form the cultural background of one's identity.

Overall, the evidence suggests that future work in economics, organizational and management science should move beyond country-level aggregates and focus on the largely neglected role of ethnicity and the delicate interactions between ethnic features (related to culture, history, and chiefs' role) and national characteristics (related to institutions and state capacity). For example, one could examine whether entrepreneurial propensity, managerial practices and the organiza-

tional structure of African firms differ systematically across ethnic lines. Another fruitful avenue of research is to examine whether there are systematic differences in credit constraints and firms' size across the quite heterogeneous ethnic groups. It is also important to understand how ethnic norms and the different historical legacies affect the organizational structure (e.g., hierarchy, delegation, hiring practises) of the emerging African corporation. Finally, more work is needed to shed light on how corporations and multinationals deal with local ethnic institutions and tribal leaders and how the "dual" coexisting institutional framework in rural Africa influences foreign investment. We hope to tackle some of these open issues in subsequent research.

References

- ACEMOGLU, D. (2005): “Politics and Economics in Weak and Strong States,” *Journal of Monetary Economics*, 52(7), 1199–1226.
- ACEMOGLU, D., I. N. CHAVES, P. OSAFO-KWAAKO, AND J. A. ROBINSON (2014): “Indirect Rule and State Weakness in Africa: Sierra Leone in Comparative Perspective,” in *African Economic Successes*, ed. by S. Edwards, S. Johnson, and D. Weil. University of Chicago Press, Chicago, IL.
- ACEMOGLU, D., AND S. JOHNSON (2005): “Unbundling Institutions,” *Journal of Political Economy*, 113(5), 949–995.
- ACEMOGLU, D., S. JOHNSON, AND J. A. ROBINSON (2001): “The Colonial Origins of Comparative Development: An Empirical Investigation,” *American Economic Review*, 91(5), 1369–1401.
- (2002): “Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution,” *Quarterly Journal of Economics*, 107(4), 1231–1294.
- (2003): “An African Success Story: Botswana,” in *In Search of Prosperity: Analytical Narrative on Economic Growth*, ed. by D. Rodrik. Princeton University Press, Princeton, NJ.
- ACEMOGLU, D., T. REED, AND J. A. ROBINSON (2014): “Chiefs: Economic Development and Elite Control of Civil Society in Sierra Leone,” *Journal of Political Economy*, 122(2), 319–368.
- ACEMOGLU, D., AND J. A. ROBINSON (2012): *Why Nations Fail? The Origins of Power, Prosperity, and Poverty*. Crown Publishers, New York, NY.
- AGHION, P., T. PERSSON, AND D. ROUZET (2012): “Education and Military Rivalry,” NBER WP 18049.
- AHLERUP, P., AND O. OLSSON (2012): “The Roots of Ethnic Diversity,” *Journal of Economic Growth*, 17(2), 71–102.
- ALESINA, A., A. DEVLEESCHAUWER, W. EASTERLY, S. KURLAT, AND R. WACZIARG (2003): “Fractionalization,” *Journal of Economic Growth*, 8(2), 155–194.
- ALESINA, A., W. EASTERLY, AND J. MATUSZESKI (2011): “Artificial States,” *Journal of the European Economic Association*, 9(2), 246–277.
- ALESINA, A. F., S. MICHALOPOULOS, AND E. PAPAIOANNOU (2012): “Ethnic Inequality,” NBER Working Paper No. 18512.

- (2014): “Inequality in Africa,” mimeo, Brown, Harvard and LBS.
- ALSAN, M. (2014): “The Effect of the TseTse Fly on African Development,” *American Economic Review*, forthcoming.
- ANGRIST, J., AND J.-S. PISCHKE (2008): *Mostly Harmless Econometrics*. Princeton University Press, Princeton, NJ.
- ARBESU, H. A. L. (2011): “Colonialism and Economic Development: Evidence from a Natural Experiment in Colonial Nigeria,” mimeo MIT.
- ASIWAJU, A. (1985): “The Conceptual Framework,” in *Partitioned Africans*, pp. 1–18. St. Martin Press, New York.
- BALDWIN, K. (2013): “Why Vote with the Chief? Political Connections and Public Goods Provision in Zambia,” *American Journal of Political Science*, 57(4), 794–809.
- (2014): “When Politicians Cede Control of Resources: Land, Chiefs, and Coalition Building in Africa,” *Comparative Politics*, 46(3), 253–271.
- BANDYOPADHYAY, S., AND E. GREEN (2012): “Precolonial Centralisation and Contemporary Development in Uganda,” EOPP Discussion Paper Series No. 26, STICERD, LSE.
- BATES, R. H. (1983): “Modernization, Ethnic Competition, and the Rationality of Politics in Contemporary Africa,” in *State versus Ethnic Claims: African Policy Dilemmas*, ed. by D. Rothchild, and V. A. Olunorola. Westview Press, Boulder, CO.
- BESLEY, T. (1995): “Property Rights and Investment Incentives: Theory and Evidence from Ghana,” *Journal of Political Economy*, 103(5), 903–937.
- BESLEY, T., AND T. PERSSON (2011): *Pillars of Prosperity. The Political Economics of Development Clusters*. Princeton University Press, Princeton, NJ.
- BESLEY, T., AND M. REYNAL-QUEROL (2014): “The Legacy of Historical Conflicts. Evidence from Africa,” *American Political Science Review*, forthcoming.
- BLOUIN, A. (2013): “Culture and Contracts: The Historical Legacy of Forced Labor,” mimeo Warwick University, Department of Economics.
- BOCKSTETTE, V., A. CHANDA, AND L. PUTTERMAN (2002): “States and Markets: The Advantage of an Early Start,” *Journal of Economic Growth*, 7(4), 347–369.

- BOONE, C. (2003): *Political Topographies of the African State: Territorial Authority and Institutional Choice*. Cambridge University Press.
- BUBB, R. (2013): “The Evolution of Property Rights: State Law or Informal Norms?,” *Journal of Law and Economics*, 56(3), 555–594.
- CASEY, K. (2012): “Crossing Party Lines: The Effects of Information on Redistributive Politics,” Stanford GSB Working Paper No. 2099.
- CASEY, K., R. GLENNERSTER, AND E. MIGUEL (2013): “Healing the Wounds: Learning from Sierra Leone’s Post-war Institutional Reforms,” in *NBER Volume on African Economic Successes*, ed. by S. Edwards, S. Johnson, and D. Weil. University of Chicago Press.
- CHAVES, I. N., AND J. A. ROBINSON (2011): “The Architecture of a Fragile State: The Case of Sierra Leone,” mimeo Harvard University, Department of Government.
- CHEN, X., AND W. D. NORDHAUS (2011): “Using Luminosity Data as a Proxy for Economic Statistics,” *Proceedings of the National Academy of Sciences*, 108(21), 8589–8594.
- CHIOVELLI, G. (2014): “Pre-Colonial Centralization, Colonial Activities and Development in Latin America,” mimeo, University of Bologna, Economics Department.
- DAVIDSON, B. (1992): *The Black Man’s Burden. Africa and the Curse of the Nation-State*. James Currey, Oxford, United Kingdom.
- DEPETRIS-CHEUVIN, E. (2014): “State History and Contemporary Conflict: Evidence from Sub-Saharan Africa,” mimeo, Brown University, Department of Economics.
- DIAMOND, J. (1997): *Guns, Germs, and Steel. The Fates of Human Societies*. W.W. Norton and Co, New York, NY.
- DIPPEL, C. (2014): “Forced Coexistence and Economic Development - Evidence from Native American Reservations,” *Econometrica*, forthcoming.
- DJANKOV, S., R. LA PORTA, F. LOPEZ-DE-SILANES, AND A. SHLEIFER (2003): “Courts,” *Quarterly Journal of Economics*, 118(2), 453–517.
- DJANKOV, S., C. MC LIESH, AND A. SHLEIFER (2007): “Private Credit in 129 Countries,” *Journal of Financial Economics*, 84(2), 299–329.
- DOLL, C. N., J.-P. MULLER, AND J. G. MORLEY (2006): “Mapping Regional Economic Activity from Night-Time Light Satellite Imagery,” *Ecological Economics*, 57(1), 75–92.

- DOUGLAS, M. (1962): “Lele Economy Compared with the Bushong: A Study of Economic Backwardness,” in *Markets in Africa*, ed. by P. Bohannan, and G. Dalton, pp. 211–233. Northwestern University Press, Evanston, ILL.
- EIFERT, B., E. MIGUEL, AND D. POSNER (2010): “Political Competition and Ethnic Identification in Africa,” *American Journal of Political Science*, 54(1), 495–510.
- ELVIDGE, C., K. BAUGH, E. KIHN, H. KROEHL, AND E. DAVIS (1997): “Mapping of City Lights Using DMSP Operational Linescan System data,” *Photogrammetric Engineering and Remote Sensing*, 63, 727–734.
- ENGLEBERT, P. (2002): “Born-again Buganda or the Limits of Traditional Resurgence in Africa,” *Journal of Modern African Studies*, 40(3), 345–368.
- (2009): *Africa, Unity, Sovereignty and Sorrow*. Lynne Rienner Publishers, Inc., Boulder, Colorado.
- ENGLEBERT, P., S. TARANGO, AND M. CARTER (2002): “Dismemberment and Suffocation: A Contribution to the Debate on African Boundaries,” *Comparative Political Studies*, 35(10), 1093–1118.
- FENSKE, J. (2013): “Does Land Abundance Explain African Institutions?,” *Economic Journal*, 123(573), 1363–1390.
- (2014): “Ecology, Trade, and States in Pre-colonial Africa,” *Journal of the European Economic Association*, forthcoming.
- FORTES, M., AND E. EVANS-PRITCHARD (1940): *African Political Systems*. Oxford University Press.
- FRANCK, R., AND I. RAINER (2012): “Does the Leader’s Ethnicity Matter? Ethnic Favoritism, Education and Health in Sub-Saharan Africa,” *American Political Science Review*, forthcoming.
- GENNAIOLI, N., AND I. RAINER (2006): “Precolonial Centralization and Institutional Quality in Africa,” in *Institutions and Norms in Economic Development*, ed. by M. Gradstein, and K. Konrad. MIT Press.
- (2007): “The Modern Impact of Precolonial Centralization in Africa,” *Journal of Economic Growth*, 12(3), 185–234.
- GENNAIOLI, N., AND H.-J. VOTH (2011): “State Capacity and Military Conflict,” mimeo UPF.

- GLENNERSTER, R., E. MIGUEL, AND A. ROTHENBERG (2013): “Collective Action in Diverse Sierra Leone Communities,” *Economic Journal*, 123(568), 285–316.
- GOLDSTEIN, M., AND C. UDRY (2008): “The Profits of Power: Land Rights and Agricultural Investment in Ghana,” *Journal of Political Economy*, 116(6), 981–1022.
- GOODY, J. (1971): *Technology, Tradition, and the State in Africa*. International African Institute by Oxford University Press.
- HENDERSON, V. J., A. STOREYGARD, AND D. N. WEIL (2012): “Measuring Economic Growth from Outer Space,” *American Economic Review*, 102(2), 994–1028.
- HERBST, J. (2000): *States and Power in Africa*. Princeton University Press, Princeton, NJ.
- HINTZE, O. (1970): *Military Organization and the Organization of the State* vol. The Historical Essays of Otto Hintze. Oxford University Press, Oxford, Uk.
- HJORT, J. (2010): “Pre-Colonial Culture, Post-Colonial Economic Success? The Tswana and the African Economic Miracle,” *The Economic History Review*, 63(3), 688–709.
- HUILLY, E. (2009): “History Matters: The Long Term Impact of Colonial Public Investments in French West Africa,” *American Economic Journal - Applied Economics*, 1(2), 176–215.
- (2011): “The Long-term Impact of European Settlement within Former French West Africa: Did Prosperous Areas Fall Behind?,” *Journal of African Economics*, 20(2), 263–311.
- JEDWAB, R., AND A. MORADI (2012): “Colonial Investments and Long-Term Development in Africa: Evidence from Ghanaian Railways,” mimeo George Washington University and Sussex University.
- JOHNSON, S., D. KAUFMANN, AND A. SHLEIFER (1997): “The Unofficial Economy in Transition,” *Brookings Papers on Economic Activity*, 2, 159–239.
- KAUFMANN, D., A. KRAAY, AND M. MASTRUZZI (2005): “Governance Matters IV: Governance Indicators,” *Policy Research Working Paper Series, The World Bank*.
- KISTRUCK, G. M., C. J. SUTTER, J. ROBERT B. LOUNT, AND B. R. SMITH (2013): “Mitigating Principal-Agent Problems in Base-of-the-Pyramid Markets: An Identity Spillover Perspective,” *Academy of Management*, 56(3), 659–682.
- KUTSOATI, E., AND R. MORCK (2012): “Family Ties, Inheritance Rights, and Successful Poverty Alleviation: Evidence from Ghana,” NBER WP 18080.

- LANDES, D. S. (1998): *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. W.W. Norton, New York, NY.
- LEWIS, A. W. (1954): “Economic Development with Unlimited Supplies of Labour,” *The Manchester School*, 22(1), 139–191.
- LOGAN, C. (2011): “The Roots of Resilience: Exploring Popular Support for African Traditional Authorities,” Afrobarometer Working Paper No. 128.
- LONG, J. D. (2012): “The Determinants of Ethnic Voting,” .
- LONG, J. D., AND B. HOFFMAN (forthcoming): “Party Attributes, Performance, and Voting in Africa,” *Comparative Politics*.
- MAIR, J., I. MARTI, AND M. J. VENTRESCA (2012): “Building Inclusive Markets in Rural Bangladesh: How Intermediaries Work Institutional Voids,” *Academy of Management Journal*, 55(4), 819–850.
- MAMDANI, M. (1996): *Citizen and Subject*. James Currey, London, UK.
- MARSHALL, M. G., AND B. R. COLE (2011): “Global Report. Conflict, Governance, and State Fragility,” Center for Systemic Peace.
- MICHALOPOULOS, S. (2012): “The Origins of Ethnolinguistic Diversity,” *American Economic Review*, 102(4), 1508–1539.
- MICHALOPOULOS, S., A. NAGHAVI, AND G. PRAROLO (2012): “Trade and Geography in the Origins and Spread of Islam,” NBER Working Paper No. 18438.
- MICHALOPOULOS, S., AND E. PAPAIOANNOU (2013a): “The Long-Run Effects of the Scramble for Africa,” NBER Working Paper No. 17620.
- (2013b): “Pre-colonial Ethnic Institutions and Contemporary African Development,” *Econometrica*, 81(1), 113–152.
- (2013c): “Pre-Colonial Statehood and African Development: New Data,” mimeo, Brown University.
- (2014): “National Institutions and Subnational Development in Africa,” *Quarterly Journal of Economics*, 129(1), 151–213.
- MICHALOPOULOS, S., L. PUTTERMAN, AND D. WEIL (2014): “The Influence of Ancestral Lifeways on Individual Economic Outcomes in Sub-Saharan Africa,” mimeo, Brown University.

- MIGDAL, J. S. (1988): *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World*. Princeton University Press, Princeton, NJ.
- MONTALVO, J.-G., AND M. REYNAL-QUEROL (2005): “Ethnic Polarization, Potential Conflict, and Civil Wars,” *American Economic Review*, 95(3), 796–816.
- MURDOCK, G. P. (1959): *Africa: Its Peoples and their Culture History*. McGraw-Hill, New York, NY.
- (1967): *Ethnographic Atlas: A Summary*. The University of Pittsburgh Press, Pittsburgh, PA.
- NKURUNZIZA, J. D., AND F. NGARUKO (2008): “Why Has Burundi Grown So Slowly? The Political Economy of Redistribution,” in *The Political Economy of Economic Growth in Africa, 1960-2000: Country Case Studies*, ed. by B. J. Ndulu, S. A. O’Connell, J.-P. Azam, R. H. Bates, A. K. Fosu, J. W. Gunning, and D. Nijinkeu, vol. 2, chap. 2. Cambridge University Press, Cambridge, UK.
- NORTH, D. C. (1981): *Structure and Change in Economic History*. Norton, New York, NY.
- NUNN, N. (2008): “The Long Term Effects of Africa’s Slave Trades,” *Quarterly Journal of Economics*, 123(1), 139–176.
- NUNN, N., AND D. PUGA (2012): “Ruggedness: The Blessing of Bad Geography in Africa,” *Review of Economics and Statistics*, 94(1), 20–36.
- NUNN, N., AND L. WANTCHEKON (2011): “The Slave Trade and the Origins of Mistrust in Africa,” *American Economic Review*, 101(7), 3221–3252.
- OSAFO-KWAAKO, P., AND J. A. ROBINSON (2013): “Political Centralization in Pre-colonial Africa,” NBER Working Paper 18770.
- PINKOVSKIY, M. (2013): “Economic Discontinuities at Borders: Evidence from Satellite Data on Lights at Night,” mimeo MIT.
- POSNER, D. N. (2005): *Institutions and Ethnic Politics in Africa*. Cambridge University Press, New York, NY.
- PUTTERMAN, L., AND D. N. WEIL (2010): “Post-1500 Population Flows and the Long-Run Determinants of Economic Growth and Inequality,” *Quarterly Journal of Economics*, 125(4), 1627–1682.

- REYNTJENS, F. (1987): “Chiefs and Burgomasters in Rwanda: The Unfinished Quest for a Bureaucracy,” *Journal of Legal Pluralism*, 25-26, 71–97.
- RIVERA-SANTOS, M., C. RUFÍN, AND A. KOLK (2012): “Bridging the Institutional Divide: Partnerships in Subsistence Markets,” *Journal of Business Research*, 65(12), 1721–1727.
- ROBINSON, J. A. (2001): “Social Identity, Inequality, and Conflict,” *Economics of Governance*, 2(2), 85–99.
- ROBINSON, J. A., AND N. Q. PARSONS (2006): “State Formation and Governance in Botswana,” *Journal of African Economics*, 15(AER Supplement 1), 100–140.
- SCHAPER, I. (1967): *Government and Politics in Tribal Societies*. Schocken Books, New York, NY.
- (1970): *Tribal Innovators: Tswana Chiefs and Social Change, 1795-1940*. Athlone Press, New York, NY.
- SKLAR, R. (1993): “The African Frontier in Political Economy,” in *Africa and the Disciplines*, ed. by R. H. Baes, V. Mutimbe, and J. F. Barr, chap. Chapter 3. University of Chicago Press, Chicago, ILL, USA.
- SRIDHARAN, S., AND M. VISWANATHAN (2008): “Marketing in Subsistence Marketplaces: Consumption and Entrepreneurship in a South Indian Context,” *Journal of Consumer Marketing*, 25(7), 455–462.
- STEVENSON, R. F. (1968): *Population and Political Systems in Tropical Africa*. Columbia University Press, New York, NY.
- TILLY, C. (1985): “Warmaking and State Making as Organized Crime,” in *Bringing the State Back In*, ed. by P. Evans, D. Rueschemeyer, and T. Skocpol. Cambridge University Press, Cambridge, UK.
- VANSINA, J. (1978): *The Children of Woot: A History of the Kuba Peoples*. University of Wisconsin Press, Maddison, WI.
- VISWANATHAN, M., J. A. ROSA, AND J. A. RUTH (2010): “Exchanges in Marketing Systems: The Case of Subsistence Consumer-Merchants in Chennai, India,” *Journal of Marketing*, 74(3), 1–17.

WEBB, J. W., G. M. KISTRUCK, D. IRELAND, AND J. DAVID J. KETCHEN (2010): “The Entrepreneurship Process in Base of the Pyramid Markets: The Case of Multinational Enterprise/Nongovernment Organization Alliances,” *Entrepreneurship Theory and Practice*, 34(3), 555–581.

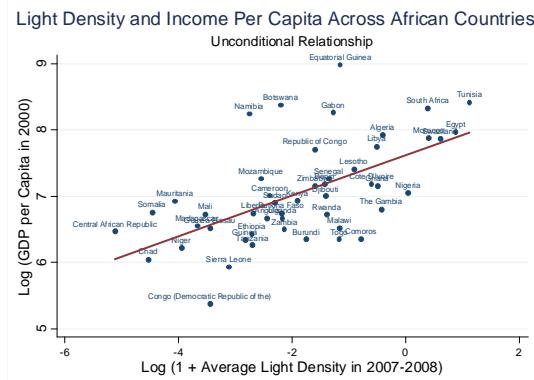
WIG, T. (2013): “Peace from the Past: Pre-colonial Political Institutions and Contemporary Ethnic Civil Wars in Africa,” mimeo, PRIO.

WOOLDRIDGE, J. M. (2002): *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge, MA.

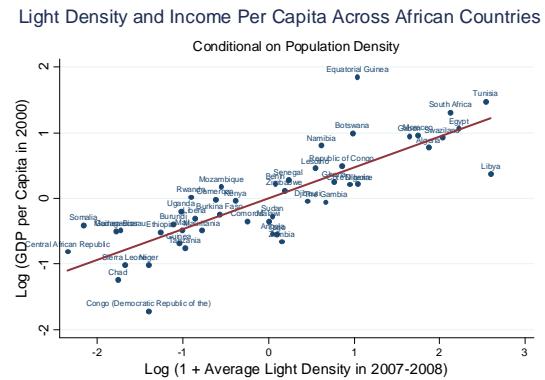
7 Appendix A: Satellite Light Density at Night and Development across and within African Countries

Henderson, Storeygard, and Weil (2012), as well as previous studies (e.g. Elvidge, Baugh, Kihn, Kroehl, and Davis (1997); Doll, Muller, and Morley (2006)) and subsequent works (Chen and Nordhaus (2011), Pinkovskiy (2013)) show that light density at night is a good proxy of economic activity at various levels of aggregation. Michalopoulos and Papaioannou (2013, 2014) provide additional evidence illustrating the strong link between luminosity and various proxies of economic well-being both across and within African countries.

Appendix Figure 1a illustrates the strong association between log per capita GDP in 2000 and log light density across African countries. The R^2 is 0.35 and the estimate is more than 6 standard errors larger than zero. Besides economic performance, light density also reflects urbanization. Appendix Figure 1b shows the relationship between log GDP per capita and log light density partialling out the effect of log population density in 2000. The relationship between log light density and log GDP per capita becomes stronger; the regression coefficient increases from 0.31 to 0.47 and the t -stat jumps to 10.

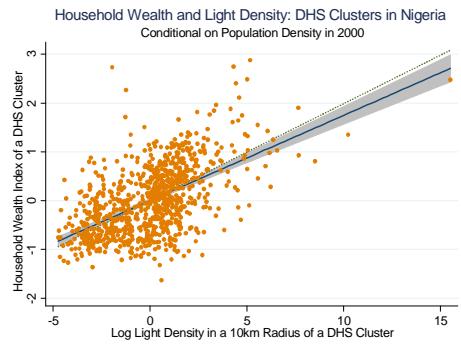


Appendix Figure 1a
Satellite Light Density and
GDP per capita, unconditional relationship

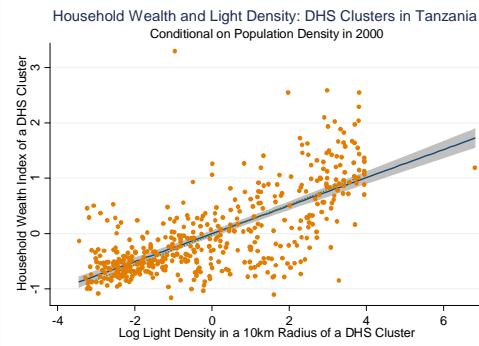


Appendix Figure 1b
Satellite Light Density and GDP
per capita, conditional on population density

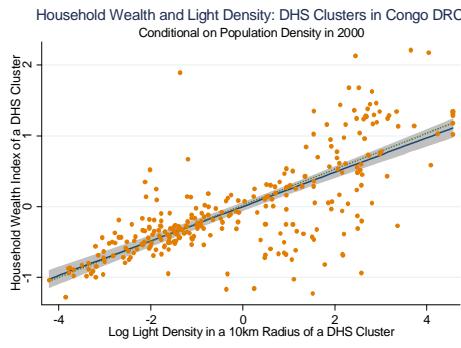
Michalopoulos and Papaioannou (2013b) combine the satellite images on light density at night with data from the Demographic and Health Surveys (DHS) and the Afrobarometer Surveys to examine in more detail the relationship between luminosity and well-being across African regions. The analysis shows that luminosity correlates strongly with various proxies of development and public goods provision measures across African regions, towns, and ethnic homelands. Below we reproduce some graphs showing the significant positive correlation between luminosity and the DHS composite wealth index for four large African countries, Tanzania, Nigeria, Zimbabwe, and the Democratic Republic of Congo.



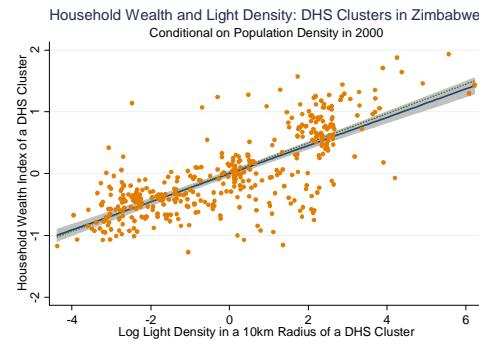
Appendix Figure 2a
Satellite Light Density and DHS Wealth Index
Nigeria



Appendix Figure 2b
Satellite Light Density and DHS Wealth Index
Tanzania



Appendix Figure 2c
Satellite Light Density and DHS Wealth Index
Democratic Republic of Congo



Appendix Figure 2d
Satellite Light Density and DHS Wealth Index
Zimbabwe

8 Appendix B: Data Definitions and Sources

Luminosity: The data come from the Defense Meteorological Satellite Program's Operational Linescan System that reports images of the earth at night captured from 20 : 00 to 21 : 30 local time. The measure is a six-bit digital number (ranging from 0 to 63) calculated for every 30-second area pixel (approximately 1 square kilometer). The resulting annual composite images are created by overlaying all images captured during each year, dropping images where lights are shrouded by cloud cover or overpowered by the aurora or solar glare and removing ephemeral lights like fires, lightning and other noise. The result is a series of global images of time-stable night lights.

State Fragility Index: Composite index of state fragility based on six dimensions, effectiveness and legitimacy of security, polity, and social-economic. The index is an aggregate of measures capturing civil conflict, the level of democracy and the inclusiveness of the political process, and government's effectiveness in achieving socioeconomic goals, such as tackling poverty, improving health, and education.

Source: Marshall and Cole (2011). <http://www.systemicpeace.org/GlobalReport2011.pdf>.

Alternative State Fragility Index: Composite index of state fragility based on four dimensions, effectiveness and legitimacy of security and the polity. The index is an aggregate of measures capturing civil conflict, the level of democracy and the inclusiveness of the political process. *Source: Marshall and Cole (2011).*

Fiscal Capacity 1 - Income Taxes: The share of revenue from income taxes as a share of GDP in the mid-1990s. *Source: Besley and Persson (2009).*

Fiscal Capacity 2 - Total Taxes: Share of total taxes as a share of GDP (in the mid-1990s). *Source: Besley and Persson (2009).*

Government Anti-Diversion Policies Index: Index of government's anti-diversion policies, measured over the period 1986 – 95. It is an equally-weighted average of these five categories: i) law and order, ii) bureaucratic quality, iii) corruption, iv) risk of expropriation and v) government repudiation of contracts (each of these items has higher values for governments with more effective policies towards supporting production) and ranges from 0 to 1. *Source: Besley and Persson (2011). Original Source: International Country Risk Guide.*

Legal Formalism: Legal system ineffectiveness index, based on the log number of calendar days needed to resolve a payment dispute through national courts (unpaid debt worth 50% of the GDP per capita). *Source: Djankov, McLiesh, and Shleifer (2007).*

Control for Corruption: The control of corruption index is "capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests." The standardized index

ranges from -2.5 to +2.5 with lower values indicating a higher degree of corruption. We use the country average over the period 1996–2004. *Source: World Bank Governance Matters Indicators Database (Kaufman et al. (2005)). available at: <http://info.worldbank.org/governance/wgi/index.asp>*

Income: Log of real per capita GDP in PPP in 2000. *Source: Penn World Tables.*

Jurisdictional Hierarchy beyond Local Community: Ordered variable ranging from 0 to 4 indicating the number of jurisdictional levels (political complexity) in each society above the local level. A 0 indicates stateless societies, 1 and 2 indicate petty and large paramount chiefdoms (or their equivalent), 3 and 4 indicate large states. *Source: Murdock (1967); variable code in the Ethnolinguistic Atlas v33; A revised version of Murdock's Atlas has been made available by J. Patrick Gray at:*

<http://eclectic.ss.uci.edu/~drwhite/worldcul/EthnographicAtlasWCRevisedByWorldCultures.sav>.

Ethnic/National Identification: Question Number: Q83. Question: *Let us suppose that you had to choose between being a [Ghanaian/Kenyan/etc.] and being a _ _ _ [R's Ethnic Group]. Which of the following best expresses your feelings?* Variable Label: Ethnic or national identity Values: 1-5, 7, 9, 998, -1 Value Labels: 1=I feel only (R's ethnic group), 2=I feel more (R's ethnic group) than [Ghanaian/Kenyan/etc.], 3=I feel equally [Ghanaian/Kenyan/etc.] and (R's ethnic group), 4=I feel more [Ghanaian/Kenyan/etc.] than (R's ethnic group), 5=I feel only [Ghanaian/Kenyan/etc.], 7=Not applicable, 9=Don't know, 998=Refused to answer, -1=Missing data. *Source: Afrobarometer Surveys Rounds 3 & 4.*

Influence of Traditional Leaders: Question Number: Q65. Question: How much influence do traditional leaders currently have in governing your local community? Variable Label: Traditional leaders influence governing local community Values: 1-4, 9, 998, -1 Value Labels: 1=None, 2=A small amount, 3=Some, 4=A great deal, 9=Don't know, 998=Refused to answer, -1=Missing data. *Source: Afrobarometer Surveys Round 4.*

Increase-Decrease of the Influence of Traditional Leaders: Question Number: Q66. Question: Do you think that the amount of influence traditional leaders have in governing your local community should increase, stay the same, or decrease? Variable Label: Traditional leaders more or less influence Values: 1-5, 9, 998, -1 Value Labels: 1=Decrease a lot, 2=Decrease somewhat, 3=Stay the same, 4=Increase somewhat, 5=Increase a lot, 9=Don't know, 998=Refused to answer, -1=Missing data. Source: Afrobarometer Round 4 Note: Interviewer probed for strength of opinion. *Source: Afrobarometer Surveys Round 4.*

Corruption Perceptions. Question Number: Q50. Question: How many of the following people do you think are involved in corruption, or haven't you heard enough about them to say: Members of Parliament, Government Officials, Elected Assembly men/women, Traditional Leaders. Value Labels: 0=None, 1=Some of them, 2=Most of them, 3>All of them, 9=Don't

know, 998=Refused to answer, -1=Missing data. Source: *Afrobarometer Surveys Round 4*.

Responsiveness. Question Number: Q54A. Question: How much of the time do you think the following try their best to listen to what people like you have to say? Values: 0-3, 9, 998, -1 Value Labels: 0=Never 1=Only sometimes, 2=Often, 3=Always, 9=Don't know, 998=Refused to answer, -1=Missing data. *Source: Afrobarometer Surveys Round 4*.

Trust. Question Number: A84. Question: How much do you trust each of the following types of people? 0=Not at all, 1=Just a little, 2=I trust them somewhat, 3=I trust them a lot, 9=Don't know, -1=Missing data. *Source: Afrobarometer Surveys Round 4*.

Primary Responsibility for Key Tasks. Question Number 58. Who do you think actually has primary responsibility for managing each of the following tasks. Is it the national government, the local government, traditional leaders, or members of your community? (a) Managing Schools (Q8B); (b) Solving Local Disputes (Q58E); (c) Allocating Land (Q58F); Maintaining Law and Order (Q58H). *Source: Afrobarometer Surveys Round 4*.